Appendix I: Biological Opinion, Formal Consultation Comments

SR 87 New Connector Road
Federal Highway Administration
Florida Department of Transportation
Santa Rosa County, Florida

Biological Opinion
FWS No. 2013-F-0159
December 20, 2013

Prepared by:
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City, FL

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ACRONYMNS

Act	Endangered Species Act
AFB	Air Force Base
BA	Biological Assessment
BMPs	Best Management Practices
BO	Biological Opinion
CALTRANS	California Department of Transportation
CEI	Construction and Engineering Inspection
cfs	cubic feet per second
CH	Critical Habitat
CR	County Road
dB_{cSEL}	Cumulative Sound Exposure Level
dB_{peak}	Peak Sound Pressure Level
dB_{RMS}	Root Mean Square Sound Exposure Level
DO	Dissolved Oxygen
DoD	Department of Defense
ERC	Ecological Resource Consultations
ERP	Environmental Resource Permit
ESBAR	Endangered Species Biological Assessment Report
ETDM	Efficient Transportation Decision Making
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation

FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FPID	Federal Project Identification
HUC	Hydrologic Unit Code
NE	No Effect
NEPA	National Environmental Policy Act
NLAA	May Affect, Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOLF	Navy Outlying Landing Field
NRDA	Natural Resource Damage Assessment
NWFWMD	Northwest Florida Water Management District
PCE	Primary Constituent Element
ROW	Right-of-Way
RPM	Reasonable and Prudent Measure
SEL	Sound Exposure Level
Service	U.S. Fish and Wildlife Service
SR	State Road
TNC	The Nature Conservancy
YOY	Young of Year

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December 20, 2013

Mr. James Christian
Division Administrator
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Attn: Mr. Joseph Sullivan

Re: FWS Log No. 2013-F-0159
Date Started: April 1, 2013
Applicant: Florida Department of Transportation
Project: New SR 87 Connector Road Phase 1 From SR 87S to SR 87N near Milton
FPID: 416748-3-22-01
Location: Blackwater River, Clear Creek
County: Santa Rosa County, FL

Dear Mr. Christian:

This letter transmits the Fish and Wildlife Service's (Service) biological opinion (BO) on a proposal from the Florida Department of Transportation (FDOT) to construct a new two-lane (Phase 1) State Road (SR) 87 connector road from SR 87S at US 90 east of Milton to SR 87N north of Milton in Santa Rosa County, Florida, in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.) Your letter requesting formal consultation was received on May 10, 2013. The Federal Highway Administration (FHWA) and FDOT agreed to add 73 days to the formal consultation timeline to account for the Service's current workload. An extension of 30 days was granted to address new information on the Gulf sturgeon. Our BO is based on information provided in the biological assessment (BA), your responses to our requests for additional information, Service investigations in the project

area, discussions with experts in the field, and other sources of information. A complete administrative record of this consultation is on file at the Service's Panama City, Florida field office.

This BO refers only to the potential adverse effects of the new SR 87 connector road, including a new two-lane bridge over the Blackwater River, on the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and endangered reticulated flatwoods salamander (*Ambystoma bishopi*) and their designated critical habitat. Table 1 identifies other federally listed species potentially occurring within the Action Area. Provided that all proposed avoidance and minimization measures are followed (refer to Appendix A), the Service concurs with FDOT's determination that road and bridge construction activities may affect, but are not likely to adversely affect (NLAA) the eastern indigo snake (*Drymarchon corais couperi*) and West Indian manatee (*Trichechus manatus latirostris*). Due to the absence of suitable habitat for the red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), and freshwater mussels species, the FDOT has determined the proposed work will have no effect on these species and they will not be discussed further in this BO.

Construction of this project is not expected to begin until 2025. The Service has agreed to this early formal consultation so that FDOT and FHWA can more readily incorporate requirements for avoiding and minimizing species impacts into the final project design and permitting requirements. As the species status may change during the 12 years between completing the biological opinion and starting Phase 1 of construction, a re-evaluation will be needed before construction occurs. This re-evaluation should be initiated at the beginning of the Right-of-Way (ROW) Phase to allow sufficient time to address potential additional information needs and project modifications.

Table 1. Other federally protected species evaluated for effects.

Species	CH in Action Area	Potentially in Action Area	Effect Determination
Eastern indigo snake	No	Yes	NLAA
Freshwater mussels	No	No	NE
Red-cockaded woodpecker	No	Yes[1]	NE
West Indian manatee	No	Yes	NLAA
Wood stork	No	Yes[1]	NE

[1]No suitable habitat determined to be present.

Consultation History

December 17, 2009 — The FDOT released six potential alternative corridors for the SR 87 connector road to be reviewed on the Efficient Transportation Decision Making (ETDM) Programming Screen.

January 22, 2010 — The Service provided initial comments on potential effects to fish, wildlife, plant, and water resources from the six alternative corridors.

January 6, 2011	The FDOT held a Corridor Public Meeting with information on the SR 87 connector road.
October 19, 2011	Ecological Resource Consultants, Inc. sent a letter to the Service requesting information on Best Management Practices to avoid and minimize effects to the Gulf sturgeon and reticulated flatwoods salamander during construction of the SR 87 connector road.
November 8, 2011	Service biologists met Ecological Resources Consultations (ERC), Inc. on site to discuss the project and assess potential impacts.
December 8, 2011	FDOT held a conference call to discuss listed species and habitat concerns with the Service and ERC, Inc.
December 9, 2011	ERC, Inc. requested by email that the Service review of a map of potential salamander breeding pond areas.
December 9, 2011	The Service provided an email response with general guidance on developing the biological assessment, including protection measures for Gulf sturgeon and using existing tools to determine potential flatwoods salamander ponds along the corridor.
December 29, 2011 to January 17, 2012	Multiple emails were exchanged between ERC, Inc. and the Service as ERC, Inc. was having difficulty receiving emails, including the email from the Service dated December 9, 2011. The email issue was rectified.
May 7, 2012	The FDOT provided the draft SR 87 Connector Road draft Endangered Species Biological Assessment Report (ESBAR) to the Service for preliminary review.
May 16, 2012	The Service provided comments by email on the draft ESBAR.
July 7, 2012	The FDOT provided a copy of the SR 87 Connector Road reticulated flatwoods salamander analysis to the Service for comments.
July 12, 2012	The Service recommended that FDOT consult formally for the reticulated flatwoods salamander, and requested additional information on the Gulf sturgeon and rare plants.
August 23, 2012	A conference call was held with the Service, FDOT, FHWA, and ERC, Inc. to discuss Section 7 consultation for the SR 87 Connector Road.

August 27, 2012 — As a follow up to the August 23, 2012, conference call, the Service provided the timing windows used to avoid in-river pile driving for the SR 87 Yellow River bridge formal consultation on Gulf sturgeon. Pile driving literature was also provided.

October 31, 2012 — A phone conversation was held between FHWA and the Service. FHWA indicated they would recommend formal consultation to FDOT for Gulf sturgeon and reticulated flatwoods salamander. Options may be available to monitor sturgeon, and narrow the work avoidance window in the future. FHWA would look into mitigation opportunities for the salamander including acquisition (*i.e.* Brunson Landing) and restoration on state lands.

April 1, 2013 — The FHWA sent a letter to the Service requesting formal consultation for the Gulf sturgeon and reticulated flatwoods salamander, and provided a biological assessment.

April 12, 2013 — The Service sent an email to FHWA requesting clarification on the effect determination for the Gulf sturgeon and reticulated flatwoods salamander, as the BA determined the project "may affect, but was not likely to adversely affect" (NLAA) these species.

April 18, 2013 — FHWA emailed the Service indicating they are discussing the effect determination with FDOT. They asked that the Service do a quick review of the BA and advise them of any additional information needs.

April 23, 2013 — The Service provided a letter to FHWA asking for clarification of the species effect determination, and requesting additional information to assist with our project review.

May 10, 2013 — The FHWA emailed the Service with a revision to their effect determination from NLAA to "may adversely affect", and requested initiation of formal consultation. They provided two supplemental documents dated May 9, 2013: a SR 87 Technical Memo and a response to FWS Questions.

May 23, 2013 — The Service sent a letter to FHWA indicating we had received their request to initiate formal consultation but was concerned that recent information indicated the project would not let for construction until late 2025. We recommended delaying formal consultation until within 5 years of construction, as species status could change significantly by 2025.

June 10, 2013 — FDOT, FHWA, and the Service met at the Panama City Field Office to discuss the timeline for formal consultation. All parties agreed formal consultation would begin on July 23, 2013, and 73 days would be added to the consultation

timeline to account for the Service's current high FDOT workload. We agreed that a re-evaluation of the BO will be needed at the beginning of the Right-of-Way Phase.

June 17, 2013 — The Service provided a letter confirming that formal consultation will initiate on July 23, 2013.

October 18, 2013 — The Service requested a 30-day extension to complete formal consultation to allow time to address new Gulf sturgeon data for the Blackwater River.

October 28, 2013 — The FHWA and FDOT agreed to a 30-day extension to the BO timeline.

November 25, 2013 — The Service provided FHWA and FDOT with a draft BO for their review.

BIOLOGICAL OPINION

1.0 DESCRIPTION OF PROPOSED ACTION

The Florida Department of Transportation (FDOT) District 3 proposes to extend State Road (SR) 87 from its intersection with US 90 east of Milton to SR 87N to the north of Milton. The project location is shown in Figure 1. Currently SR 87 is a shared facility with US 90 for 4.6 miles and goes through historic downtown Milton. The new connector is proposed to improve north-south connectivity for hurricane evacuation, enhance movement of freight, and provide additional traffic capacity. The six corridors originally under study have been reduced to two alternatives. Both alternatives are of similar length (7-8 miles) and cross designated critical habitat for the Gulf sturgeon (Blackwater River within Critical Habitat Unit 4 Yellow River) and reticulated flatwoods salamander (RFS) (Critical Habitat Unit RFS-2, Subunit A) at the same locations; thus, effects to these species are expected to be the same irrespective of the final corridor selection. The location of these critical habitat units relative to the two alignments is shown in Figure 2.

Construction will occur in two phases. During Phase 1 of construction, the FDOT will construct a two-lane road using both a rural undivided typical section with two 12-foot travel lanes, 5-foot outside paved shoulders, and drainage swales, and an urban undivided typical section with two 12-foot travel lanes, 4-foot paved bike lanes, a 12-foot multi-use path, and a stormwater collection system. Sufficient right-of-way (ROW) (up to 264 feet) will be acquired to allow for future road capacity improvements (Phase 2 build-out). This biological opinion (BO) is for Phase 1 construction activities, although the effects of future build-out are considered.

A new bridge will be constructed across the Blackwater River; build-out will include a future second twin span but initially the western southbound bridge will be constructed. The bridge will begin south of the Blackwater River and continue on the north side of the river where it will terminate after crossing the Blackwater Heritage State Trail and the floodplain of Clear Creek. The bridge will be approximately 5,570 feet in length with 180 linear feet over the Blackwater River. The Phase 1 bridge typical section will consist of two 12-foot lanes, a 6-foot inside paved

shoulder, a 10-foot outside paved shoulder, a 1.5-foot barrier, and a 12-foot multi-use trail. The in-river portion of the interim bridge will consist of one bent with nine piles. For the purposes of this BO, we have defined in-river work to include all work occurring within the banks and bed of the river. It does not include the use of boats in the river or work above the ordinary high water line. All pile bents will be 24-in pre-stressed pile placed approximately six feet apart. Boats or barges would be used during construction, and work on bridge supports (temporary work bridge) will be conducted over the river but above the water line. Where the bridge crosses RFS critical habitat, approximately 38 bents will be used to support the bridge with 17 pilings per bent for a total of 646 pilings. Pilings will be installed by pile driving from a shallow draft barge.

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Figure 1. SR 87 Connector Road location map.

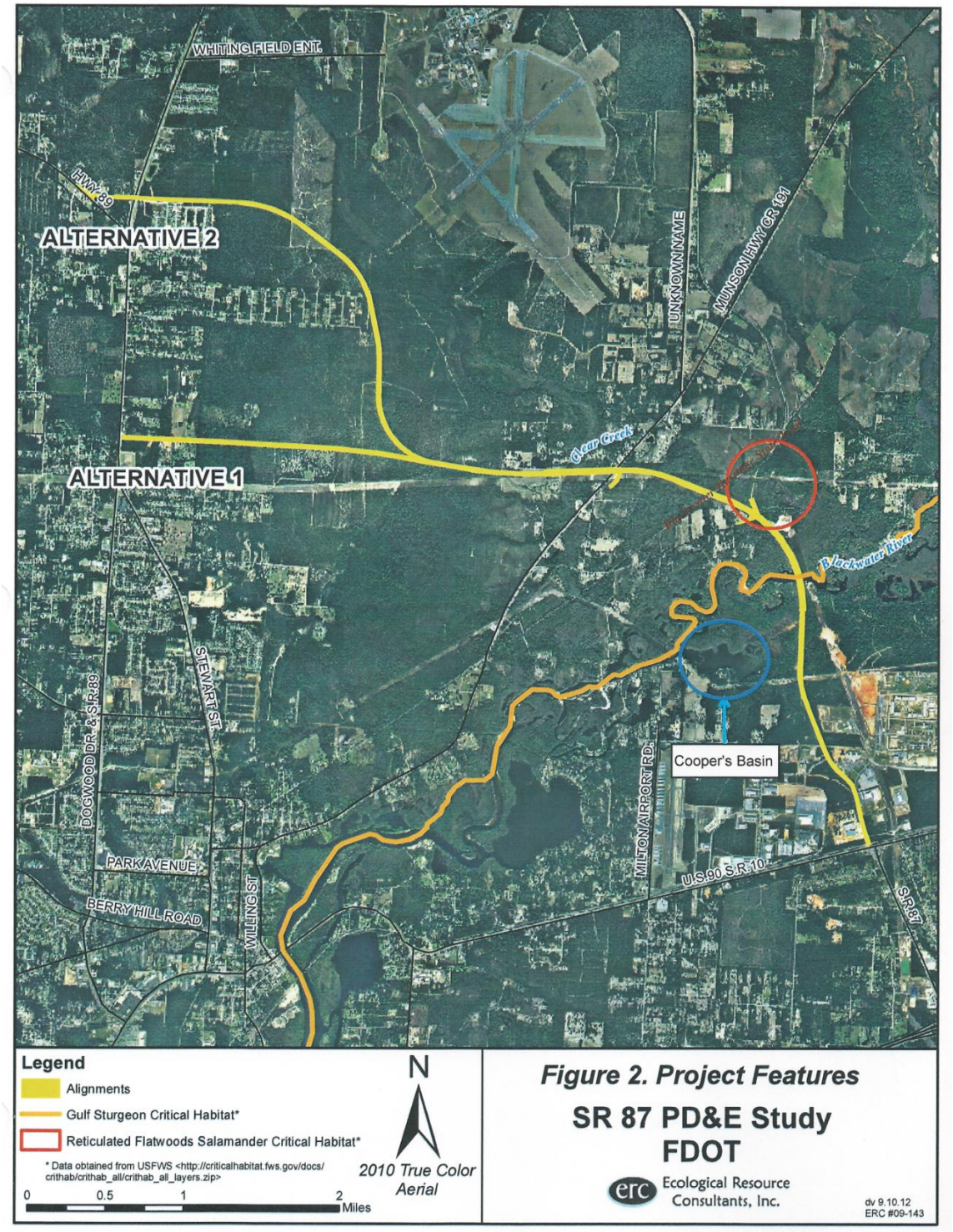

Figure 2. SR 87 Connector Road Alternatives and Critical Habitat Units.

1.1 Purpose and Need

The primary project purpose is to more effectively serve freight movement and provide for an improved hurricane evacuation route from the Gulf coast to areas north in Alabama. The extension is also intended to reduce congestion in the City of Milton, and to alleviate travel demand on the section of US 90 currently shared by SR 87. The new corridor is needed to provide additional capacity, and to improve regional connectivity by providing a more direct route from areas of high growth in northern Santa Rosa County to areas to the south such as Navarre and the US 98 corridor. Access will also be improved to and from I-10 for the Whiting Field US Naval Air Station, and the County's Joint Use Planning Area near Whiting Field. The new roadway is also needed to provide relief to Ward Basin Road and its intersection with US 90 and much needed relief to the US 90 Blackwater River Bridge.

1.2 Action Area

The Action Area is defined at 50 CFR 402 to mean "all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." Therefore, the Action Area may be larger than the construction limits of the project. The impact radius for roads is variable, depending on the ecological factors under consideration and the habitat the road traverses. Direct project effects to the Gulf sturgeon include: in-river work that may alter their behavior within the Blackwater River; noise, vibration, and turbidity from pile driving during temporary work bridge and permanent bridge construction/pile installation; sedimentation and turbidity from shoreline ground disturbing activities such as clearing, grubbing, stormwater pond and access road construction, discharges from stormwater ponds, etc. Bends in the river will likely attenuate sound both up and downstream for work on the Blackwater River, and reduce downstream transport of any inadvertent release of sediment from the construction site. Potential direct effects to the RFS during bridge construction within their critical habitat unit include vegetation clearing, soil disturbance, increased soil compaction and vibration from construction vehicles, and loss of habitat due to placement of pilings. Indirect effects to both species may include: secondary growth facilitated by the new roadway that results in increased loss of habitat and/or increased disturbance; daily noise and vibration from traffic; pollutants in the air and water from vehicle emissions; changes in the quality and quantity of stormwater runoff; and potential altered site hydrology. It is expected that most direct and indirect effects should occur within a 1,500-foot buffer of the ROW (Nedwell *et al.* 2003; Abbott 2004; Forman *et al*. 2003). Additional considerations in defining the action area are the importance of Coopers Basin as a sturgeon holding area, its proximity to the new connector, the risk of stormwater ponds discharging into the basin, and the potential for altered land use surrounding the basin as a result of improved access.

The Action Area for this biological opinion is (1) the 200-foot ROW corridor plus a buffer of 1,500 feet on either side of the corridor for the length of the alignments; (2) the Blackwater River upstream 1,500 feet from the new bridge and downstream 1.7 miles to the inlet to Coopers Basin; (3) Coopers Basin; (4) the land area surrounding Coopers Basin (as bounded by the river and powerline easements); and (5) reticulated flatwoods salamander Critical Habitat Unit RFS-2,

Subunit A. The use of environmentally-sensitive bridge construction techniques, Best Management Practices (BMPs) for water quality protection, and other conservation measures are expected to minimize the zone of influence for the project.

1.3 Conservation Measures

Conservation measures are actions to benefit or promote the recovery of a listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant and serve to minimize or compensate for project effects on the listed species. The BA states that the FDOT will implement the following avoidance and minimization measures to reduce impacts to the Gulf sturgeon and its critical habitat Unit 4: Yellow River, and to the RFS and its critical habitat Unit RFS-2, Subunit A.

General Construction

1. Environmentally sensitive areas will be identified and flagged.

2. Wetland impacts will be minimized to the maximum extent practicable in order to maintain overall water quality in the receiving water bodies. Any unavoidable impacts will be mitigated. Wetland mitigation located within the watershed of the project site will ensure that water resources in the general watershed are protected.

3. Erosion control measures will be installed to protect areas outside of the work limits. Erosion control measures include, but are not limited to, silt fencing and/or straw/hay bales around the limits of construction areas, floating turbidity barriers for all in-river work, and temporary sediment containment ponds. The erosion controls will be inspected per State standards as designated in the Stormwater Pollution Prevention Plan by a State certified stormwater management inspector. Additional inspection and maintenance will be conducted following rain events to ensure that any necessary maintenance is conducted.

4. In the location of the bridge, clearing and grubbing will be limited to cutting vegetation to the ground surface. Root raking will only be used in areas where piling cap supports are anticipated, which will minimize impacts to the floodplain wetlands that support the Blackwater River and the RFS critical habitat unit.

5. Embankment and excavation will not be employed within the Gulf sturgeon critical habitat or the RFS critical habitat since both areas will be bridged.

6. Where embankments are constructed, only clean fill will be used that does not contain any muck, vegetation, stumps, roots, brush, rubbish, or reinforced bar. If dewatering is required, all water will be pumped to upland areas on the edge of the ROW that will be contained with silt fencing. Water will be allowed to percolate through in these upland areas to prevent sediment runoff from entering adjacent wetlands. Once the embankments are completed, they will be compacted and stabilized prior to paving and surfacing operations.

7. Excavated material will be stockpiled in designated upland areas that will be enclosed with silt fencing and hay bales. The stockpile areas will be inspected regularly and will be kept moist to reduce observed windblown particulates.

8. Construction mats will be used within wetland areas to minimize soil disturbances and rutting, and to maintain existing micro-topography and water levels.

9. FDOT will ensure that all staging areas are within uplands and are contained with erosion control measures. Construction staging areas will be located outside of the Blackwater River floodplain.

10. Best Management Practices (BMPs) specific to Outstanding Florida Waters (OFW) will be implemented during construction and stormwater design to prevent degradation of the Blackwater River.

11. Ponds with discharges into wetland areas associated with the Blackwater River will treat water to OFW standards. The remainder of the stormwater ponds will meet the state requirements under the Environmental Resource Permit (ERP).

Gulf sturgeon

12. All stormwater from the completed bridge surface will be collected and conveyed to stormwater treatment ponds.

13. In-river pile driving will be avoided during May and June to minimize potential direct harm to Gulf sturgeon during the peak period when fish may be present in the river near the project location.

14. The Blackwater River Bridge will span the entire river and its floodplain, and a minimum number of pilings will be installed in the river.

15. Pile bents will be used instead of columns on piling caps to reduce direct impacts to river bottom.

16. No dredging or use of explosives in or adjacent to the river will be done.

17. Sturgeon migratory corridors will not be physically blocked or impeded.

18. In order to minimize impacts to Gulf sturgeon that may be using the river at the time of construction, the contractor will "ramp-up" for piling installation by conducting several (up to five) soft hammer blows before commencing the harder hammer blows. The "ramp-up" is intended to alert fish that construction is commencing and give them time to move away from the construction site.

19. During in-river pile driving, erosion control measures will be installed around the limits of the work area and will be maintained until piling installation in each area is complete. Specifically:

    a. The work area will be separated from the adjacent open water using floating turbidity barriers. The barriers will be installed around the limits of the work area and downstream of the work site prior to commencing work, and removed no more than 24 hours after work is completed.

    b. The barriers located downstream of the worksite will be removed at the end of each work day and replaced prior to commencing work the following day. Barriers will not be removed before turbidity returns to background levels.

    c. Dewatering should not be necessary.

20. FDOT will purchase, donate, or fund the purchase of up to four fish tag receptors for use in the Blackwater River system, in an amount not to exceed $5,000. FDOT requests copies of the processed or raw data obtained from the receptors for use in future project efforts.

Reticulated Flatwoods Salamander

21. During planning, the corridor was shifted to the south in Unit RFS-2, Subunit A to avoid areas of highest habitat quality. Impacts will be over the most disturbed portion of the critical habitat unit.

22. The FDOT committed to constructing a bridge over Unit RFS-2, Subunit A to reduce direct and secondary impacts to critical habitat that would occur at ground elevations.

23. All stormwater will be collected from the completed bridge surface and conveyed to stormwater ponds located outside of the RFS critical habitat unit.

24. Mats will be installed during construction to minimize impacts to the soil surface.

25. Pile bents will be used instead of columns on piling caps to reduce direct impacts to critical habitat. Direct impacts to RFS habitat were reduced from 0.15 acre to 0.018 acre.

26. The ROW will be accessed for construction and maintenance from the maintained powerline easement.

27. FDOT will provide compensation for the loss of RFS habitat through a monetary contribution up to $10,000 to a third party for activities that contribute to the conservation of the RFS. The work plan for these conservation activities will be coordinated with the Service and FDOT, and will be mutually agreed to as suitable for offsetting effects to RFS habitat.

Maintenance Activities

28. Precautions will be taken during preventative maintenance tasks such as painting and cleaning to protect the Blackwater River and the RFS critical habitat. Preventative measures include conducting work from a maintenance traveler, platform, or over a suspended net or tarp to capture rust, paint, and paint removing agents and prevent discharge into the water or wetland below the bridge. If sanding is necessary, sanders with vacuum filter bags will be used. The water used for cleanup will be collected and disposed of to avoid impacts to the water or wetland below the bridge.

2.0 STATUS OF THE SPECIES

2.1 Gulf Sturgeon

2.1.1 Species Description

The Gulf sturgeon (*Acipenser oxyrinchus* (=*oxyrhynchus*) *desotoi*), also known as the Gulf of Mexico sturgeon, is an anadromous fish (breeding in freshwater after migrating up rivers from marine and estuarine environments), inhabiting coastal rivers from Louisiana to Florida during the warmer months and over wintering in estuaries, bays, and the Gulf of Mexico. It is a nearly cylindrical primitive fish embedded with bony plates or scutes. The head ends in a hard, extended snout; the mouth is inferior and protrusible and is preceded by four conspicuous barbels. The caudal fin (tail) is heterocercal (upper lobe is longer than the lower lobe). Adults range from 1.2 to 2.4 m (4 to 8 ft) in length, with adult females larger than males. The Gulf sturgeon is distinguished from the geographically disjunct Atlantic coast subspecies (*A. o. oxyrinchus*) by its longer head, pectoral fins, and spleen (Vladykov 1955; Wooley 1985). King et al. (2001) have documented substantial divergence between *A. o. oxyrinchus* and *A. o. desotoi* using microsatellite DNA testing.

2.1.2 Critical Habitat Description

The Service and National Marine Fisheries Service (NMFS) jointly designated Gulf sturgeon critical habitat on April 18, 2003 (68 FR 13370, March 19, 2003). Gulf sturgeon critical habitat includes areas within the major river systems that support the seven currently reproducing subpopulations and associated estuarine and marine habitats. Gulf sturgeon use rivers for spawning, larval and juvenile feeding, adult resting and staging, and moving between the areas that support these life history components. Gulf sturgeon use the lower riverine, estuarine, and marine environment during winter months primarily for feeding and for inter-river movements.

Fourteen areas (units) are designated as Gulf sturgeon critical habitat (Figure 2). Critical habitat units encompass approximately 2,783 km (1,729 mi) of riverine habitats and 6,042 km^2 (2,333 mi^2) of estuarine and marine habitats, and include portions of the following Gulf of Mexico rivers, tributaries, estuarine and marine areas:

Unit 1 Pearl and Bogue Chitto Rivers in Louisiana and Mississippi;
Unit 2 Pascagoula, Leaf, Bowie, Big Black Creek and Chickasawhay Rivers in Mississippi;
Unit 3 Escambia, Conecuh, and Sepulga Rivers in Alabama and Florida;
Unit 4 Yellow, Blackwater, and Shoal Rivers in Alabama and Florida;
Unit 5 Choctawhatchee and Pea Rivers in Florida and Alabama;
Unit 6 Apalachicola and Brothers Rivers in Florida;
Unit 7 Suwannee and Withlacoochee River in Florida;
Unit 8 Lake Pontchartrain (east of causeway), Lake Catherine, Little Lake, the Rigolets, Lake Borgne, Pascagoula Bay and Mississippi Sound systems in Louisiana and Mississippi, and sections of the state waters within the Gulf of Mexico;
Unit 9 Pensacola Bay system in Florida;
Unit 10 Santa Rosa Sound in Florida;
Unit 11 Nearshore Gulf of Mexico in Florida;
Unit 12 Choctawhatchee Bay system in Florida;
Unit 13 Apalachicola Bay system in Florida; and
Unit 14 Suwannee Sound in Florida.

Figure 3. Designated critical habitat and historic range of Gulf sturgeon.

Critical habitat determinations focus on those physical and biological features (primary constituent elements [PCEs]) that are essential to the conservation of the species (50 CFR 424.12). Federal agencies must ensure that their activities are not likely to result in the destruction or adverse modification of designated critical habitats. Therefore, proposed actions that may affect designated critical habitat require an analysis of potential impacts to the PCEs. The PCEs of Gulf sturgeon critical habitat are:

- Abundant food items, such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
- Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;
- A flow regime (*i.e.* the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
- Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
- Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (*e.g.* an unobstructed river or a dammed river that still allows for passage).

2.1.3 Life History

Like most sturgeons, the Gulf sturgeon is characterized by large size, longevity, delayed maturation, high fecundity, and far-ranging movements. Gulf sturgeon typically live for 20-25 years, but can reach ages of at least 42 years old (Huff 1975). Age at sexual maturity ranges from 8-12 years for females and 7-9 years for males (Huff 1975). High fecundity has been demonstrated by Chapman et al. (1993), who estimated that mature female Gulf sturgeon weighing between 29 and 51 kg (64 and 112 lb) produce an average of 400,000 eggs. Long-range migrations from the open Gulf of Mexico to bays and estuaries to coastal rivers are also common. Migratory behavior of the Gulf sturgeon is likely influenced by sex and reproductive status (Fox et al. 2000), change in water temperature (Wooley and Crateau 1985; Chapman and Carr 1995; Foster and Clugston 1997), and increased river flow (Chapman and Carr 1995; Heise

et al. 1999a, b; Sulak and Clugston 1999; Ross et al. 2000 and 2001b; Parauka *et al*. 2001; B. Tate, pers. comm. 2012).

In general, all life stages of Gulf sturgeon migrate into rivers in the spring (from late February to May), where sexually mature sturgeon spawn when the river temperature rises to between 17-25°C. Similar to Atlantic sturgeon, Gulf sturgeon are believed to exhibit a long inter-spawning period, with male Gulf sturgeon capable of annual spawning, but females requiring more than one year between spawning events (Huff 1975; Fox *et al*. 2000) and only a small percentage of females spawn in a given year (Sulak and Clugston 1999; Pine *et al*. 2001). Therefore, Gulf sturgeon population viability is highly sensitive to changes in adult female mortality and abundance (Pine *et al*. 2001; Flowers 2008).

Spawning occurs in the upper reaches of rivers, at least 100 km (62 miles) upstream of the river mouth (Sulak *et al*. 2004), in habitats consisting of one or more of the following: limestone bluffs and outcroppings, cobble, limestone bedrock covered with gravel and small cobble, gravel, and sand (Marchant and Shutters 1996; Sulak and Clugston 1999; Heise *et al*. 1999a; Fox et al. 2000; Craft *et al*. 2001; Service unpub. data 2005; Pine *et al*. 2006). These hard bottom substrates are required for egg adherence and shelter for developing larvae (Sulak and Clugston 1998). Documented spawning depths range from 1.4 to 7.9 m (4.6 to 26 ft) (Fox et al. 2000; Ross *et al*. 2000; Craft *et al*. 2001; Service unpub. data 2005; Pine *et al*. 2006).

Gulf sturgeon eggs are demersal and adhesive, and require at least 2 to 4 days to hatch (Parauka et al. 1991; Chapman *et al*. 1993). After hatching, larval Gulf sturgeon are particularly sensitive to water temperatures above 25°C (Chapman and Carr 1995). Young-of-year (YOY) fish disperse widely throughout the river and remain in freshwater for 10 to 12 months after spawning occurs (Sulak and Clugston 1999). They are typically found in open sand-bottom habitat away from the shoreline and vegetated habitat.

Throughout early spring to late autumn, Gulf sturgeon of all ages remain in freshwater until fall (6 to 9 months) (Odenkirk 1989; Foster 1993; Clugston *et al*. 1995; Fox *et al*. 2000; Sulak *et al*. 2009). They typically occupy discrete areas either near the spawning grounds (Wooley and Crateau 1985; Ross *et al*. 2001b) or downstream areas referred to as summer resting or holding areas. These resting areas are often located in deep holes, and sometimes shallow areas, along straight-aways ranging from 2 to 19 m (6.6 to 62.3 ft) deep (Wooley and Crateau 1985; Morrow *et al*. 1998; Ross *et al*. 2001a, b; Craft *et al*. 2001; Hightower *et al*. 2002), and frequently near (not in) natural springs (Clugston *et al*. 1995; Foster and Clugston 1997; Hightower *et al*. 2002). The substrates consist of mixtures of limestone and sand (Clugston *et al*. 1995), sand and gravel (Wooley and Crateau 1985; Morrow *et al*. 1998), or just sandy substrate (Hightower *et al*. 2002). With the exception of YOY fish, Gulf sturgeon do not typically feed during freshwater residency (Mason and Clugston 1993; Gu *et al*. 2001). Sulak *et al*. (2012) reported that the vast majority (~94%) of juvenile, subadult, and adult Gulf sturgeon sampled from the Suwannee River exhibited complete feeding cessation for the 8-9 month summer residency; however, a small percentage (~6%) of juveniles and subadults did feed in freshwater.

All non-YOY begin to migrate downstream from fresh to saltwater around September (at about 23°C [73°F]) through November (Huff 1975; Wooley and Crateau 1985; Foster and Clugston

1997), and they spend the cool months in estuarine areas, bays, or in the Gulf of Mexico (Odenkirk 1989; Foster 1993; Clugston *et al*. 1995; Fox *et al*. 2002). During the fall migration, Gulf sturgeon may require a period of physiological acclimation to changing salinity levels, referred to as osmoregulation or staging (Wooley and Crateau 1985). This period may be short (Fox *et al*. 2002) as sturgeon develop an active mechanism for osmoregulation and ionic balance by age 1 (Altinok *et al*. 1998). Some adult Gulf sturgeon may also spawn in the fall (Randall and Sulak 2012).

Throughout fall and winter, juveniles feed in the lower salinity areas in the river mouth and estuary (Sulak and Clugston 1999; Sulak *et al*. 2009), while subadults and adults migrate and feed in the estuaries and nearshore Gulf of Mexico habitat (Foster 1993; Foster and Clugston 1997; Edwards *et al*. 2003, 2007; Parkyn *et al*. 2007). Some Gulf sturgeon may also forage in the open Gulf of Mexico (Edwards *et al*. 2003).

The Gulf sturgeon is a benthic (bottom dwelling) suction feeder; it feeds mostly upon small invertebrates in the substrate using its highly protrusible tubular mouth. The type of invertebrates ingested varies by habitat but are mostly soft-bodied animals that occur in sandy substrates. Young-of-the-year Gulf sturgeon feed on freshwater aquatic invertebrates, mostly insect larvae and detritus (Mason and Clugston 1993; Sulak and Clugston 1999; Sulak *et al*. 2009). Juveniles (less than 5 kg (11 lbs), ages 1 to 6 years) forage in lower salinity habitats near the river mouth and in the estuaries, and subadults and adults feed in the estuary and nearshore feeding grounds in the Gulf of Mexico (Foster 1993; Foster and Clugston 1997; Edwards et al. 2003, 2007; Parkyn *et al*. 2007). Prey in estuarine and marine habitats include amphipods, brachiopods, lancelets, polychaetes, gastropod mollusks, shrimp, isopods, bivalve mollusks, and crustaceans (Huff 1975; Mason and Clugston 1993; Carr *et al*. 1996; Fox *et al*. 2000; Fox *et al*. 2002). Ghost shrimp (*Lepidophthalmus louisianensis*) and haustoriid amphipods (e.g., *Lepidactylus* spp.) are strongly suspected to be important prey for adult Gulf sturgeon over 1 m (3.3 ft) in length (Heard *et al*. 2000; Fox *et al*. 2002).

Marine movement, habitat, and feeding data indicate that Gulf sturgeon prefer open, sandy habitat containing high abundances of known benthic prey (Fox *et al*. 2002; Parauka *et al*. 2001; Harris et al. 2005). In bays and estuaries, Gulf sturgeon generally prefer shallow areas (depths less than 3.5 m, 11.5 ft) (Parauka *et al*. 2001; Craft *et al*. 2001) or deep holes near passes (Craft *et al*. 2001). Gulf sturgeon using nearshore Gulf of Mexico areas are generally found at depths less than 6-10 m (33 ft) (Ross *et al*. 2001a; Fox *et al*. 2002; Rogillio *et al*. 2002; Parauka 2012 pers. comm.). Generally, fish are found in near shore areas off Perdido Bay and between Pensacola and Apalachicola Bays (Fox *et al*. 2002; Parauka 2012 pers. comm.) and in the Mississippi Sound along the barrier islands, where they are relocated most often at the passes between islands (Ross *et al*. 2001a; Rogillio *et al*. 2002). Telemetry-tagged Gulf sturgeon from different natal river systems are regularly detected in the same marine foraging areas.

Previous tagging studies indicated that Gulf sturgeon exhibit river fidelity (Service and GSMFC 1995). Stabile et al. (1996) identified five regional or river-specific stocks (from west to east): (1) Lake Pontchartrain and Pearl River, (2) Pascagoula River, (3) Escambia and Yellow Rivers, (4) Choctawhatchee River, and (5) Apalachicola, Ochlockonee, and Suwannee Rivers. Dugo *et al* (2004) reported that genetic structure occurs at the drainage level for the Pearl, Pascagoula,

Escambia, Yellow, Choctawhatchee, and Apalachicola rivers (no samples were taken from the Suwannee population). Additional genetic studies by Brian Kreiser at the University of Southern Mississippi indicate that there is strong population structure in all rivers across its range, and a clear difference between populations east and west of Mobile Bay (B. Kreiser 2012 pers. comm.). Gulf sturgeon do make inter-river movements (Service unpubl. data 2012; Krieser 2012 pers. comm.), and more genetic research is needed to determine if inter-stock movement is resulting in inter-stock reproduction.

2.1.4 Population Status

Historically, the Gulf sturgeon occurred from the Mississippi River east to Tampa Bay (Figure 3). Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida. Sporadic occurrences have been recorded as far west as the Rio Grande River between Texas and Mexico, and as far east and south as Florida Bay (Wooley and Crateau 1985; Reynolds 1993).

In the late 19th century and early 20th century, the Gulf sturgeon supported an important commercial fishery, providing eggs for caviar, flesh for smoked fish, and swim bladders for isinglass, which is a gelatin used in food products and glues (Huff 1975; Carr 1983). Gulf sturgeon numbers declined due to overfishing throughout most of the 20th century. The decline was exacerbated by habitat loss associated with the construction of dams and sills (low dams), mostly after 1950. In several rivers throughout the species' range, dams and sills have severely restricted sturgeon access to historic migration routes and spawning areas (Wooley and Crateau 1985; McDowall 1988).

On September 30, 1991, the Service and the National Marine Fisheries Service (NMFS) listed the Gulf sturgeon as a threatened species under the Act (56 FR 49653). Threats and potential threats identified in the listing rule included: construction of dams, modifications to habitat associated with dredging, dredged material disposal, de-snagging (removal of trees and their roots) and other navigation maintenance activities; incidental take by commercial fishermen; poor water quality associated with contamination by pesticides, heavy metals, and industrial contaminants; aquaculture and incidental or accidental introductions; and the Gulf sturgeon's long maturation and limited ability to recolonize areas from which it is extirpated.

The Service and NMFS conducted a 5 year status review in 2009 where we concluded that the following threats continue to affect Gulf sturgeon and its habitat: impacts to habitats by dams, dredging, point and nonpoint discharges, climate change, bycatch, red tide, and collisions with boats (Service and NMFS 2009). Additional threats may include ship strikes and potential hybridization due accidental release of non-native sturgeon. These threats persist to varying degrees in different portions of the species range. The juvenile stage of Gulf sturgeon life history is the least understood, and perhaps the most vulnerable as this cohort remains in the river for the first years of its life and is therefore exposed to most of the threats faced by the species and its habitat. Further, the species' long-lived, late-maturing, intermittent spawning characteristics make recovery a slow process.

Currently, seven rivers are known to support reproducing subpopulations of Gulf sturgeon. Table 2 lists these rivers and most-recent estimates of subpopulation size. Abundance numbers indicate a roughly stable or slightly increasing population trend over the last decade in the eastern river systems (Florida), with a much stronger increasing trend in the Suwannee River and a possible decline in the Escambia River. Populations in the western portion of the range (Mississippi and Louisiana) have never been nearly as abundant, and their current status is unknown as comprehensive surveys have not occurred in the past ten years.

At this time, the Service characterizes the status of the species as stable; however, the status of the subpopulations in the Pearl and Pascagoula rivers is uncertain. These rivers do not have current population estimates and have recently been threatened by hurricanes, the Deepwater Horizon oil spill, and a pot-liquor spill in the Pearl River. The Gulf sturgeon continues to meet the definition of a threatened species. While some riverine populations number in the thousands, about half the populations have abundances in the hundreds. Loss of a single year class could be catastrophic to some riverine populations with low abundance. Further, while directed fisheries no longer occur, many threats continue and new ones are arising. Data are not yet available to determine if Gulf sturgeon recovery is limited by factors affecting recruitment (*e.g.* spawning habitat quantity or quality), adult survival (*e.g.* incidental catch in fisheries directed at other species), or the late-maturing, intermittent reproductive characteristics of the species.

2.1.5 Analysis of the Gulf Sturgeon/Critical Habitat Likely to be Affected

This BO addresses the effects of constructing a new SR 87 Connector Road and Blackwater River Bridge on the Gulf sturgeon and its designated critical habitat. The Gulf sturgeon is found seasonally in the Blackwater River and its distributaries from early spring until late fall.

The Blackwater River is not currently known to support a reproducing subpopulation of Gulf sturgeon. However, the Blackwater River provides essential summer resting and staging habitat for a substantial number of fish that are known to be natal to the Yellow River, which is one of the seven reproducing subpopulations of the Gulf sturgeon. Therefore, the Blackwater River is included in the critical habitat for the Yellow River system. Unit 4 includes the Yellow River mainstem, downstream to its discharge at Blackwater Bay, all Yellow River distributaries and the Blackwater River from its confluence with Big Coldwater Creek to its discharge at Blackwater Bay. Based on historic and current use of deep holes on the Blackwater River, Wright and Cooper basins are also within the unit. Unit 4 provides spawning sites and potential summer resting areas for the Yellow River Gulf sturgeon subpopulation. Road and bridge construction may affect water and sediment quality in the Blackwater River, and alter behavior as a result of physical and acoustic effects from pile driving and other work activities within the river. Therefore, in this BO we limit our analysis of effects to Gulf sturgeon to the Yellow River subpopulation of the species in critical habitat Unit 4.

Table 2. Estimated size of known reproducing subpopulations of Gulf sturgeon.

In some cases, multiple estimates are presented based on differences in population estimation models used. All estimates apply to a proportion of the population exceeding a minimum size, which varies by researchers according to the sampling method used. CI = confidence interval. NR = not reported.

River	Year of data collection	Abundance Estimate	Lower Bound 95% CI	Upper Bound 95% CI	Source
Pearl	2001	430	323	605	Rogillio et al. 2001
Pascagoula	2000	181	38	323	Ross et al. 2001
Pascagoula	2000	206	120	403	Ross et al. 2001
Pascagoula	2000	216	124	429	Ross et al. 2001
Escambia	2006	451	338	656	USFWS 2007
Yellow	2011	1,036	724	1,348	USFWS 2012 unpub. data
Blackwater[1]	2013	437	362	550	USFWS 2013 unpub. data
Choctawhatchee	2008	3,314	NR	NR	USFWS 2009
Apalachicola	2005	2,000	NR	NR	Pine and Martell 2009a
Apalachicola	2010	1,292	616	1,968	USFWS 2010 unpub. data
Suwannee	2004	10,000	NR	NR	Pine and Martell 2009a
Suwannee	2006	6,524	5,181	8,243	Randall 2013
Suwannee	2007	6,873	5,253	9,018	Randall 2013
Suwannee	2012	7,228	5,375	9,771	Randall 2013

2.2 Reticulated Flatwoods Salamander

2.2.1 Species Description

Originally listed as one species in 1999 (USFWS), research done by Pauly *et al*. (2007) resulted in a taxonomic revision that used mitochondrial DNA, morphology, and allozymes to reclassify the flatwoods salamander into two species: the reticulated flatwoods salamander (RFS) (*Ambystoma bishopi*) and frosted flatwoods salamander (*Ambystoma cingulatum*). The flatwoods salamander was subsequently listed as two distinct species in 2009 (74 FR 6700, February 10, 2009). The Apalachicola River drainage forms a geographic barrier between the two species, with the RFS occurring west of the river. The RFS is a moderately sized salamander that is generally black to chocolate-black with fine, irregular light gray lines and specks that form a cross-banded pattern across their backs. The back pattern is more net-like in the RFS and it is slightly smaller in size than the frosted flatwoods salamander. When compared to the frosted flatwoods salamander, the RFS has fewer costal grooves, shorter forelimbs and hind limbs, a smaller head, and males have shorter tails. Spots are less distinct in the RFS, which gives it a "salt and pepper" appearance.

[1] The Blackwater River is not one of the seven known reproducing subpopulations. It is considered part of the Yellow River spawning population.

2.2.2 Critical Habitat Description

Critical habitat was designated concurrent with listing the RFS and frosted flatwoods salamander (74 FR 7600, February 10, 2009). Eight units were designated for the RFS, some of which are divided into subunits, for a total of 16 units and subunits (Figure 4). Fourteen of the units and subunits are in Florida, and two are located in Georgia. Critical habitat encompasses a total of 4,453 ac (1,803 ha) of which 3,476 ac (1,396 ha) are privately-owned lands, 953 ac (397 ha) are state lands, and 25 ac (10 ha) are owned by local government. In addition, several geographic areas totaling 2,881 ac (1,166 ha) were considered to meet the definition of critical habitat for the RFS but were exempted from final critical habitat designation due to their protection under Department of Defense's (DoD) Integrated Natural Resource Management Plans. These areas included locations on the Navy Outlying Landing Field (NOLF) Holley, Eglin Air Force Base (AFB), and Hurlburt Field.

Critical habitat units were based on lands considered to be occupied at the time of listing and that contained sufficient PCEs to support life history functions essential for the conservation of the species. The PCEs of RFS critical habitat are:

- Breeding habitat. Small (generally less than 1 to 10-acre), acidic, depressional standing bodies of fresh water (wetlands) that:
    - Are seasonally flooded by rainfall in late fall or early winter and dry in late spring or early summer;
    - Are geographically isolated from other water bodies;
    - Occur within pine flatwoods-savanna communities;
    - Are dominated by grasses and grass-like species in the ground layer and overstories of pond-cypress, blackgum, and slash pine;
    - Have a relatively open canopy, necessary to maintain the herbaceous component that serves as cover for flatwoods salamander larvae and their aquatic invertebrate prey; and
    - Typically have a burrowing crayfish fauna, but, due to periodic drying, the breeding ponds typically lack large, predatory fish (for example, *Lepomis* (sunfish), *Micropterus* (bass), and *Amia calva* (bowfin)).

- Non-breeding habitat. Upland pine flatwoods-savanna habitat that is open, mesic woodland maintained by frequent fires and that:
    - Is within 1,500 ft (457 m) of adjacent and accessible breeding ponds;
    - Contains crayfish burrows or other underground habitat that the flatwoods salamander depends upon for food, shelter, and protection from the elements and predation;
    - Has an organic hardpan in the soil profile, which inhibits subsurface water penetration and typically results in moist soils with water often at or near the surface under normal conditions; and
    - Often have wiregrasses as the dominant grasses in abundant herbaceous ground cover, which supports the herbivorous invertebrates that serve as a food source for the flatwoods salamander.

- Dispersal habitat. Upland habitat areas between non-breeding and breeding habitat that allow for salamander movement between such sites and that is characterized by:
    - A mix of vegetation types representing a transition between wetland and upland vegetation (ecotone);
    - An open canopy and abundant native herbaceous species;
    - Subsurface structure, such as that created by deep litter cover or burrow, which provides shelter for salamanders during seasonal movements.

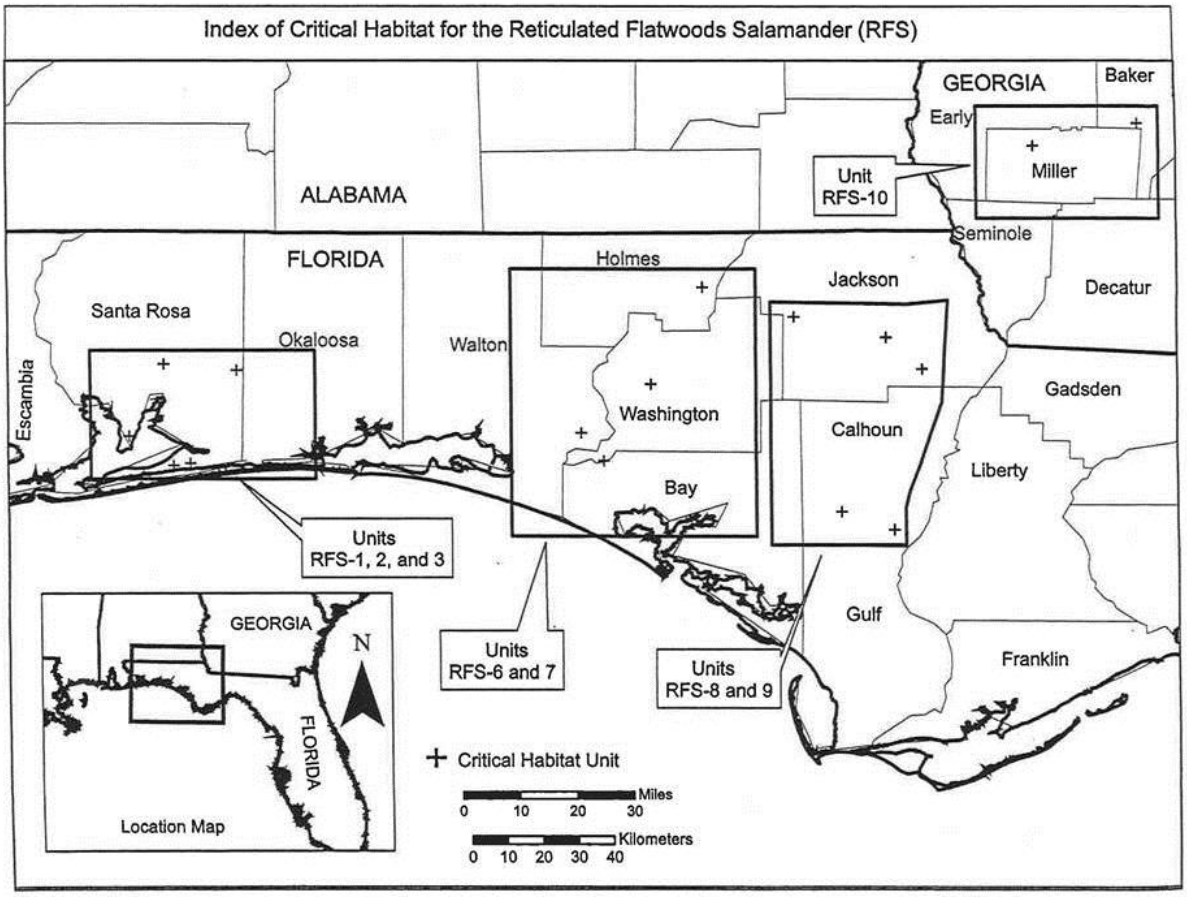

Figure 4. Distribution of reticulated flatwoods salamander critical habitat units.

2.2.3 Life History

Although much of the available literature is for *Ambystoma cingulatum*, as far as we currently know there are no differences in life history and habitat between the RFS and frosted flatwoods salamander; thus, the discussion of life history is applicable to both species. The flatwoods salamander is endemic to the southeastern Coastal Plain and occurs in areas that were historically longleaf pine-wiregrass flatwoods and savannas (Palis and Means 2005). Adults are terrestrial and live underground most of the year in upland flatwoods sites where they occupy burrows (Goin 1950; Neill 1951; Mount 1975; Ashton and Ashton 2005). Their breeding season is late

September through December when the rains associated with passing cold fronts likely trigger their migration to the relatively small, isolated ephemeral ponds where they breed (Means 1972; Anderson and Williamson 1976; Means *et al*. 1996; Palis 1997). Adult flatwoods salamanders are rarely encountered above ground and most observations have been associated with drift fences, road crossings, and at or in breeding ponds (Bishop 1943;Goin 1950; Means *et al*. 1996; Harrison 2003; Ashton and Ashton 2005).

Up to 225 eggs can be produced by females, with larger females producing more eggs (Ashton 1992; Anderson and Williamson 1976). Females may oviposit either directly into ponds or onto dry substrate. Anderson and Williamson (1976) observed egg deposition under leaf litter, beneath logs, or at the base of grasses prior to a pond inundating; the eggs did not hatch until the pond filled with water. In Florida, researchers have observed egg deposition directly into water onto submerged grasses with hatching occurring within 8 days (Ashton and Ashton 2005). During the daytime larvae will shelter amidst submerged grasses, only emerging into open water at night (Palis 1996). The larval period ranges from 11 to 18 weeks with metamorphosis typically taking place in March and April, although it may occur as late as May (Palis 1995; Palis 1996; Ashton and Ashton 2005; Means 1986).

Post meta-morphic salamanders migrate out of the ponds and into uplands where they live underground in crayfish burrows, root channels, or burrows of their own making until they move back to ponds to breed as adults (Groin 1950; Neill 1951; Mount 1975; Ashton and Ashton 2005). The distance between the wetland breeding habitat and the upland terrestrial habitats of post-larval and adult salamanders can vary considerably. According to Ashton (1992), flatwoods salamanders have been documented up to 5,576 ft (1,700 m) from breeding ponds. In the final listing rule, however, the Service used an estimate of 1,476 ft (450 m) as the radius of a flatwoods salamander's principal activity area around a breeding pond based on research summarized in Semlitsch (1998) on this species and other species in its genus (Service 1999).

Flatwoods salamanders can reach adult size within one year in captivity, although field studies suggest it may take three to four years for wild salamanders to attain full size (Palis 1997; Means 1972). Sexual maturity can be reached before they are full size, and may occur during their first year for males and within two years for females (Palis 1997). The lifespan of *Ambystoma cingulatum* in the wild is unknown, although captive animals have lived no more than four years (Palis and Means 2005).

Post-larval flatwoods salamanders eat small invertebrates associated with their underground habitat. Earthworms have been detected in the stomachs of dissected adult salamanders (Goin 1950). A diverse and abundant herbaceous layer of native species is considered important to maintain the prey base necessary for adult flatwoods salamanders. Larval salamanders likely prey on various aquatic invertebrates and other small larval vertebrates (Palis and Means 2005). A recent study found that freshwater crustaceans dominated the stomach contents of larval flatwoods salamanders captured in Florida and South Carolina (Whiles *et al*. 2004). Good water quality is necessary to maintain the aquatic invertebrate fauna eaten by larval salamanders.

2.2.4 Distribution and Status

The historical range of the RFS included parts of Alabama, Florida, and Georgia, which are in the lower Coastal Plain of the southeastern United States west of the Apalachicola-Flint Rivers. We have 26 historical (pre-1990) records for the RFS. In Alabama, there are five historical locations for the RFS, all in the extreme southern portion of the State in Baldwin, Covington, Houston, and Mobile Counties. Surveys have been conducted at numerous sites since 1992, but no flatwoods salamanders have been observed in Alabama since 1981 (Jones *et al*. 1982; Godwin 2008). Two historical records are known from Georgia, one each in Baker and Early Counties. Subsequent sites visits have indicated that suitable habitat at those locations is no longer present (LaClaire 1994). Four new RFS breeding ponds have been discovered in Georgia since 1990. One pond is on the State's Mayhaw Wildlife Management Area in Miller County, Georgia. Three ponds that support two RFS populations are on private property in Baker County, Georgia. Nineteen historical records for the RFS are known in Florida. Breeding has been documented at only five (26%) of these sites since 1990. Extensive surveys throughout the range conducted prior to the original listing in 1999 resulted in identification of 39 additional breeding sites. Thirty-one (80%) of these sites are in Okaloosa and Santa Rosa counties, primarily on DoD lands. Currently 18 populations of RFS are known for Florida.

At present, the flatwoods salamander is located in isolated populations scattered across its historical range where remnants of suitable habitat remain. The combined data from all survey work completed since 1990 in Florida and Georgia indicate that there are 20 populations of the RFS and distribution has been reduced. Some of these populations are inferred from the capture of a single individual. Nine (45%) of the known RFS populations occur, at least in part, on public land. Of these, DoD lands in Florida harbor four populations of the RFS at Eglin AFB, Hurlburt Field, and NOLF Holley. State and local agencies in Florida and Georgia partially manage habitat for five additional populations and monitor breeding ponds. In Florida, Pine Log State Forest has a single population. The Northwest Florida Water Management District (NWFWMD) and Yellow River Marsh Preserve State Park share management of most of another property supporting an additional population; and the Santa Rosa County School Board owns a portion of the habitat supporting a single population. In Georgia, the Mayhaw Wildlife Management Area supports a single population. Eleven (55%) RFS populations are solely on private lands.

The major threat to the RFS is loss of habitat – including both terrestrial longleaf pine/slash pine flatwoods and its isolated, seasonally inundated breeding ponds. The historical area of pine flatwoods (long leaf pine/wiregrass flatwoods and slash pine flatwoods) was approximately 32 million acres. This area has been reduced to approximately 5.2 million acres or 18% of its original extent (Outcalt 1997). Much of historical pine flatwoods habitat has been converted into managed silviculture plantations. Pine plantations typically use heavy mechanical site preparation, high stocking rates, and low fire frequencies – which degrade flatwoods salamander habitat by creating dense canopied forests with an understory dominated by shrubs or pine needles. Wiregrass, an important component of flatwoods salamander habitat, is lost or reduced as a result of fire suppression and soil disturbance. Fire suppression is a leading cause of the degradation of remaining longleaf pine forest habitat. Fire is also a necessary component to

maintain the breeding pond vegetation and a suitable ecotone plant community (Palis 1997). Land conversion to urban development and agriculture has also eliminated several known flatwoods salamander populations in Alabama, Georgia, and Florida.

In addition to the loss of terrestrial habitat, the number and diversity of the small wetlands where flatwoods salamanders breed have been substantially reduced. Threats to breeding sites include altered hydrology, agriculture and urban development, road construction, intensive silviculture practices, shrub encroachment, filling of ponds, conversion of wetlands to fish ponds, livestock grazing, soil disturbance, and fire suppression. These threats can be exacerbated by droughts. A study in Florida on a population of frosted flatwoods salamanders showed reproductive failure and declining adult immigration to the breeding site over three years of consecutive drought (Palis *et al*. 2006).

Roads contribute to habitat fragmentation by isolating blocks of remaining contiguous habitat. They may disrupt migration routes and dispersal of individuals to and from breeding sites. Road construction can result in changes in hydrology and destruction of breeding ponds. In addition, vehicles may cause the death of salamanders as they attempt to cross roadways (Means 1996).

2.2.5 Analysis of the Reticulated Flatwoods Salamander/Critical Habitat Likely to be Affected

This BO addresses the effects of constructing a new SR 87 Connector Road and Blackwater River Bridge on the RFS and its designated Critical Habitat Unit RFS-2, Subunit A. The BA also evaluated the potential for RFS breeding ponds along the length of the proposed roadway using an established desktop GIS methodology with field verification. Only two ponds showed greater than a Low potential as RFS habitat: ponds 1 and 2. Both ponds are associated with the critical habitat unit. Habitat quality for Pond 1 is Moderate-High and Pond 2 is Low-Moderate. Pond 1 was known to be occupied at the time of the original listing. Our analysis will focus on effects to the entire critical habitat unit which includes the two ponds.

The boundaries of the critical habitat unit are intended to encompass all life stages of the RFS. Adult RFS may be found underground in terrestrial habitat except when migrating to ponds to breed in late September through December. Breeding ponds may contain eggs or larvae from late September until larvae metamorphose in March and April, and occasionally into May. Post meta-morphic salamanders then migrate into terrestrial habitat. Therefore, in this BO we limit our analysis of effects to reticulated flatwoods salamander to the population in Unit RFS-2, Subunit A.

3.0 ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the "effects of the action" on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all federal, state, or private actions and other activities in the Action Area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in

process. The environmental baseline for this opinion considers all projects approved prior to the initiation of formal consultation.

3.1 Gulf Sturgeon

3.1.1 Status of the Species within the Action Area

The Action Area includes: (1) the 200-foot ROW corridor plus a buffer of 1,500 feet on either side of the corridor for the length of the alignments; (2) the Blackwater River upstream 1,500 feet from the new bridge and downstream to the inlet for Coopers Basin; (3) Coopers Basin; (4) the land area surrounding Coopers Basin as bounded by the river and powerline easements; and (5) reticulated flatwoods salamander Critical Habitat Unit RFS-2, Subunit A. Although the Action Area does not include the full extent of Gulf sturgeon habitat in the Blackwater River, this project has the potential to affect the Yellow River subpopulation due to the high use of basins, such as Coopers Basin, by sturgeon for resting/aggregating downstream of the project. Therefore, the status of the subpopulation in the Yellow River is generally the same as its status in the Action Area. Information specific to the Blackwater River is provided when available.

The Yellow River subpopulation of Gulf sturgeon was estimated to be roughly 1,300 net vulnerable (roughly age 4+) individuals in 2011 (Service unpub data 2012). A similar census in the fall of 2003 estimated the population size was 911 individuals (Berg *et al*. 2007), which indicates that the population may have been growing at a rate of about 5% per year for the past ten years (depending on the accuracy of the estimates). Pine *et al*. (2001) found positive population growth of about 5% annually for adults within the Suwannee River subpopulation, and this is believed to be the maximum average annual rate of increasing Gulf sturgeon populations over time. Evidence of recruitment has also been observed in recent years, suggesting that the Yellow River subpopulation is viable (*i.e*. regularly reproducing) (Berg *et al*. 2007; Kreiser *et al*. 2008; Service 2011-2012 unpub data).

Gulf sturgeon are known to spawn at sites within about a 5-km (~ 3-mi) reach of the Yellow River downstream of SR 55 (approximately rkm 130) in Alabama near the Florida border (Kreiser *et al* 2008; Service 2010-2012 unpub. data). The Service also confirmed spawning at a site in Florida downstream of CR 2 (Service 2011 unpub. data). Several holding areas have been identified by Craft *et al*. (2001) in the lower Yellow River downstream of rkm 60. The most populated holding area was found between SR 87 and Boiling Creek (rkm 11-16), and additional sites have been documented near Miller's Bluff (rkm 23), south of River's Edge Campground (rkm 42), and Gin Hole Landing (rkm 58) (Craft *et al*. 2001). The Service has recently confirmed the continued use of these areas.

Three recent telemetry studies have advanced knowledge of Gulf sturgeon movement and habitat use in the Yellow River: 1) Eglin Air Force Base (AFB) and the DoD funded telemetry in marine environments near Eglin AFB from 2008-2010, 2) the National Oceanic and Atmospheric Administration (NOAA) funded a telemetry study assessing adult mortality rates since 2010, and 3) additional telemetry work was funded under the Natural Resources Damage Assessment (NRDA) of the Deepwater Horizon oil spill beginning in 2010. These studies have resulted in a total of approximately 200 telemetry-tagged adult Gulf sturgeon in the Yellow and Blackwater

rivers in 2012. The Service monitored riverine movement and habitat use of these tagged fish in the Yellow River in 2011 and 2012, and in the Blackwater River in 2013.

Fish biologists at the Service began an intensive study of Gulf sturgeon in the Blackwater River during the summer of 2013. Forty-two fish were tagged; all were >100 cm in size. Sampling was done weekly throughout the summer until the sturgeon's fall out-migration. The total population size was estimated to be 437 fish (Table 2), of which 400-430 are in a size range >100 cm (Service data 2013a unpub.). Many of these fish are from the Yellow River. Thirty-one telemetry tagged fish from the Yellow River arrived in the Blackwater in April, May, and June. It is generally thought that each telemetry tag represents approximately 10 fish; therefore over 70% of the fish in the Blackwater River may be Yellow River fish.

While spawning is not known to occur on the Blackwater River, both Wright and Cooper basins are historic and current holding/resting areas. Early after arriving in the Blackwater, more fish are found higher up in the river. A stationary receiver placed at Big Eddy (30.65926 N, -86.97871 W), just upstream of the proposed bridge, recorded 3 tagged fish on multiple occasions in April, May, and June. Gulf sturgeon abundance estimates from side scan sonar indicate that 350-400 individuals from the Blackwater River occur in Coopers Basin at a given time. High discharge following rainfall events then appear to cause fish to disperse, but they return as flows stabilize. The fish begin moving downstream as the summer progresses.

3.1.2 Status of the Critical Habitat within the Action Area

This portion of the environmental baseline section focuses on Unit 4 Yellow River, the designated critical habitat for the Gulf sturgeon in the Action Area, describing what we know about the physical and biological features (PCEs) that are essential to the species' conservation within the Action Area. The Action Area does not include the estuarine critical habitat in Unit 9 Pensacola Bay, as we do not expect impacts of bridge and road construction to extend downstream beyond Coopers Basin; therefore, PCEs for estuarine or marine habitat are not discussed.

1. Food items:

Riverine benthic invertebrate communities serve as prey primarily for YOY and juvenile Gulf sturgeon (see Section 2.3). Lewis (2010) summarized recent invertebrate collections in the Action Area and found that communities were dominated by midge (Tendipedidae) and mayfly (Ephemeroptera) larvae, oligochaetes and bivalves (particularly the Asian clam, *Corbicula fluminea*). Overall, Yellow River habitats were considered relatively productive compared to other Pensacola Bay river systems (*i.e*. Blackwater and Escambia rivers). There is no evidence to indicate the food resources in the Yellow River are inadequate to support YOY and juvenile Gulf sturgeon at this time. Relatively few Gulf sturgeon <100 cm are thought to occur on the Blackwater River, although this may be due to the lack of spawning habitat (with associated YOY and juvenile fish) rather than limited food resources.

2. Riverine spawning sites:

No riverine spawning sites are known to occur on the Blackwater River. As described in Section 3.1, Gulf sturgeon spawn on the Yellow River at sites above rkm 125 near the Alabama/Florida border and at one site below CR 2 in Florida. Thus, no spawning sites occur within the project Action Area.

3. Riverine aggregation areas:

As described in Section 3.1, at least four Gulf sturgeon holding areas occur in the Yellow River main stem downstream of rkm 60. Two holding areas occur on the Blackwater River: Wright Basin and Cooper Basin; and one holding area is located on the Shoal River. A recent study by the Service (Service 2013a unpub. data) has demonstrated the importance of Coopers Basin and a section of mainstem on the Blackwater River for summer aggregation (Figure 5). Approximately 80-91% of sturgeon in the Blackwater use Coopers Basin at some point during the summer. Coopers Basin is within the project Action Area.

Land clearing associated with agriculture, silviculture, and recreation have led to increased sedimentation in the Blackwater River basin. Vehicles using unpaved roads in Blackwater River State Forest have increased soil erosion, causing increased stream turbidity and smothering aquatic habitat in some areas. Development is still sparse along the river mainstem, and scattered on the south shore of Coopers Basin. No development is present along much of the reach where fish are aggregating, and to the north of Coopers Basin. Despite some overall degradation to the watershed, at this time we are unaware of specific alterations to the riverine aggregation areas that would limit the ability of the designated critical habitat to function for the conservation of the species.

Figure 5. Sample snap shot to illustrate Gulf sturgeon holding areas on the Blackwater River in 2013 (USFWS 2013a unpub. data).

4. Flow regime:

The Yellow and Blackwater rivers exhibit moderate seasonality in flows (Lewis 2010), with highest flows in the winter and early spring (January through March) and lowest flows in the fall (September through November). The U.S. Geological Service stream gauge on the Blackwater River near Baker, Florida, has been measuring river depth and discharge since 1952 with a contributing area of 205 square miles (Hall *et al*. 2010). The river depth averages 3.5 to 4 feet deep. Discharge can vary widely, from below 25 cfs to over 20,000 cfs. The variation shows the impact of two major droughts from 1998 to 2002 and 2006 to 2008. Surface water from the Yellow and Blackwater river basins have not played a major role in water supply (NWFWMD 2012), and most of the water supply for municipal and agricultural uses is extracted from the sand and gravel aquifer. An expansion of the wellfield between the two rivers has been proposed, although at this time we are unaware of specific flow regime alterations that may limit the ability of the designated critical habitat to function for the conservation of the species.

5. Water quality:

The Blackwater River is designated by Florida statute section 403.061(27), as an Outstanding Florida Water (OFW) due to its exceptional recreational and ecological significance. This designation put restrictions on some activities that could lower ambient water quality. The Blackwater River system is subject to a variety of nonpoint pollution sources that can include agricultural run-off, leaching septic tanks, and development activities such as road building or shoreline stabilization (Hall *et al*. 2010). Despite these impacts, water quality throughout the system has been characterized overall as excellent (Blair *et al.* 2010). A partial assessment of water quality in 104 segments making up the Blackwater River watershed was undertaken by the Florida Department of Environmental Protection (FDEP) in 1998 (FDEP 2006). Eight segments were added to the 303(d) List of Parameters of Concern, including the Blackwater River. Within the Action Area, water body identification number 24B covers the Action Area; it was added to the 303(d) list for coliforms concerns.

The water chemistry of the Blackwater River is unique, and has naturally low oxygen and nutrient levels (Hall *et al*. 2010). The river may be especially vulnerable to change from additional inputs of nutrients or chemicals. Much of the geology and soils are comprised of sand which has poor retention of organics and nutrient pollutants; thus, nutrients can move rapidly from their source into surface and ground waters. An influx of nutrients can boost algal growth, causing an increase in biological oxygen demand and further decrease dissolved oxygen levels in a system where levels are already low (Hall *et al.* 2010).

The Gulf sturgeon is more sensitive to hypoxia (insufficient oxygen levels) than other well-known oxyphillic species, such as rainbow trout (Secor and Niklitschek 2001). Sturgeons have a limited behavioral and physiological capacity to respond to hypoxia, and basal metabolism, growth, consumption, and survival are sensitive to changes in oxygen levels (Secor and Niklitschek 2001). The sensitivity of sturgeons to low dissolved oxygen (DO) conditions

appears to decrease as the fish matures, with YOY fish being the most sensitive. In laboratory experiments, young (< 77 days old) shortnose sturgeon (*A. brevirostrum*) died at oxygen levels of 3.0 mg/l and all sturgeon died at oxygen levels of 2.0 mg/l (Jenkins *et al*. 1993). Niklitschek and Secor (2009) tested YOY Atlantic sturgeon at 20°C and found a no effect at 6.70 mg/L, high mortality at 3.47 mg/L, and chronic deleterious effects of 4.82 mg/L. The FDEP rule for Class III waterways is that DO should not fall below 5 mg/L. Of six sampling locations monitored in the Blackwater River basin and recorded in the 2009 Florida STORET database, four sites had all samples fall within 6 and 12 mg/L and two sites had numerous occurrences of DO < 5 mg/L (Hall *et al*. 2010). Multiple factors can contribute to occasional occurrences of low DO including proximity to estuarine waters, water depth, time of day, and weather conditions.

At this time, it appears that water quality in the Yellow River critical habitat unit, including the Blackwater River, is considered adequate for the conservation of Gulf sturgeon.

6. Sediment quality:

The Blackwater River watershed's geology is composed of the Citronelle Formation and Terrace and Alluvial deposits (Hall *et al.* 2010). Deeply weathered fine to coarse quartz sand with scattered limonite pellets and some gravel content are the main composition of the Citronelle Formation. Its riverbanks tend to be highly erodible sands, which can lead to problems with bank erosion and excess sedimentation into the river. Human activities such as agriculture, timber harvesting, road construction, and development can contribute to erosion. The FDEP has set three criteria for use as indicators of increased sedimentation in water bodies: turbidity, total suspended solids (TSS), and specific conductance. The six sampling locations in the STORET database were examined by Hall *et al.* (2010) for long term trends in sedimentation. Overall, turbidity does not appear to be a problem. While TSS is a concern for the watershed, concentrations were low. A lack of turbidity and TSS likely reflects the sandy sediment type which lacks fines which suspend more readily in the water column. Specific conductance was low at sites 1 to 4, but had high values after 1999 at sites 5 and 6. Site 5 (near the Action Area) is listed as contaminated with fecal coliform and site 6 is near the developed area of Milton where land use activities may cause increased sedimentation (Hall *et al.* 2010).

At this time, the status of the sediment quality PCE of Gulf sturgeon critical habitat in the Blackwater and Yellow rivers is not pristine, but we do not have evidence that it is limiting the ability of the designated critical habitat to function for the conservation of the species. We are not aware of sediment quality impairments that have resulted in death, injury, or reduced growth and reproductive success to Gulf sturgeon in this system, and the subpopulation appears to be slowly increasing (see section 3.1.1).

7. Safe and unobstructed migratory pathways:

No spawning sites are known on the Blackwater River. Fish instead migrate up the Blackwater to congregate during the summer in deep holes and resting/staging areas. Approximately 70 percent of the sturgeon found in the Blackwater River arrive from the Yellow River, likely after they have spawned (Service unpub. data 2013a). Both the Yellow River and Blackwater River are free-flowing. At this time, we are unaware of any other ongoing hazards or obstructions that

may limit migratory movements within the Yellow River critical habitat unit.

3.1.3 Factors Affecting the Species Environment within the Action Area.

No other actions affecting the species environment are expected within the Action Area. However, two bridge construction projects are being planned by FDOT within Yellow River critical habitat and formal consultation has been concluded: the SR 87 Yellow River bridge (FWS # 2013-F-0033) and US 90 Yellow River bridge (FWS # 2013-F-0098). Fish affected by the new SR 87 Connector Road may also be affected by these two bridge projects on the Yellow River.

3.2 Reticulated Flatwoods Salamander

3.2.1 Status of the Species within the Action Area

The Action Area includes the full extent of reticulated flatwoods salamander Critical Habitat Unit RFS-2, Subunit A. This unit encompasses 162 ac (66 ha) on private land in Santa Rosa County, Florida. The unit is located northeast of Milton, Florida. The approximately 5-acre cypress dome swamp within the unit was surveyed for flatwoods salamander larvae by J. Palis in 1993. Ten larvae were captured in 63 meter-long sweeps. No subsequent surveys have occurred at this location; it is presumed to remain occupied (Mitchell pers. com. 2013).

In addition to its small population size, limited habitat, and vulnerability to disease and predation, several factors negatively affect the RFS. Key threats are intensifying land use and fire suppression which lead to habitat loss/degradation; these threats are greatest for privately owned parcels. After the January 9, 2001 U.S. Supreme Court decision on Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers, protection of isolated wetlands under Section 404 of the Clean Water Act (CWA) was greatly reduced. With the Army Corps of Engineers limited in their jurisdiction over isolated wetlands, existing regulatory mechanisms are inadequate to protect the RFS's ephemeral breeding ponds from loss and destruction. Impacts may also occur indirectly when new development surrounds RFS habitat and alters both hydrology and water quality. These threats, coupled with continued habitat alteration and periods of extreme drought, put the RFS at danger of extinction throughout all of its range. The threats occur at such a high magnitude that they affect the species throughout its entire range with a high degree of severity. In the 2009 listing (74 FR 6700; February 10, 2009) the RFS was determined to be endangered.

3.2.2 Status of the Critical Habitat within the Action Area

This portion of the environmental baseline section focuses on Unit RFS-2, Subunit A (Figure 6), the designated critical habitat for the RFS in the Action Area, and describing what we know about the physical and biological features (PCEs) that are essential to the species' conservation within the Action Area. All PCEs are contained in the critical habitat unit. Potential threats to the RFS and its habitat that may require special management of the PCEs within this unit include agricultural and urban development, detrimental alterations in forestry practices that could damage sub-surface soil structure, potential hydrological changes to the habitat, and the fire

suppression (Service 2009). The habitat assessment completed for the BA provides the following information on the current condition of the PCEs:

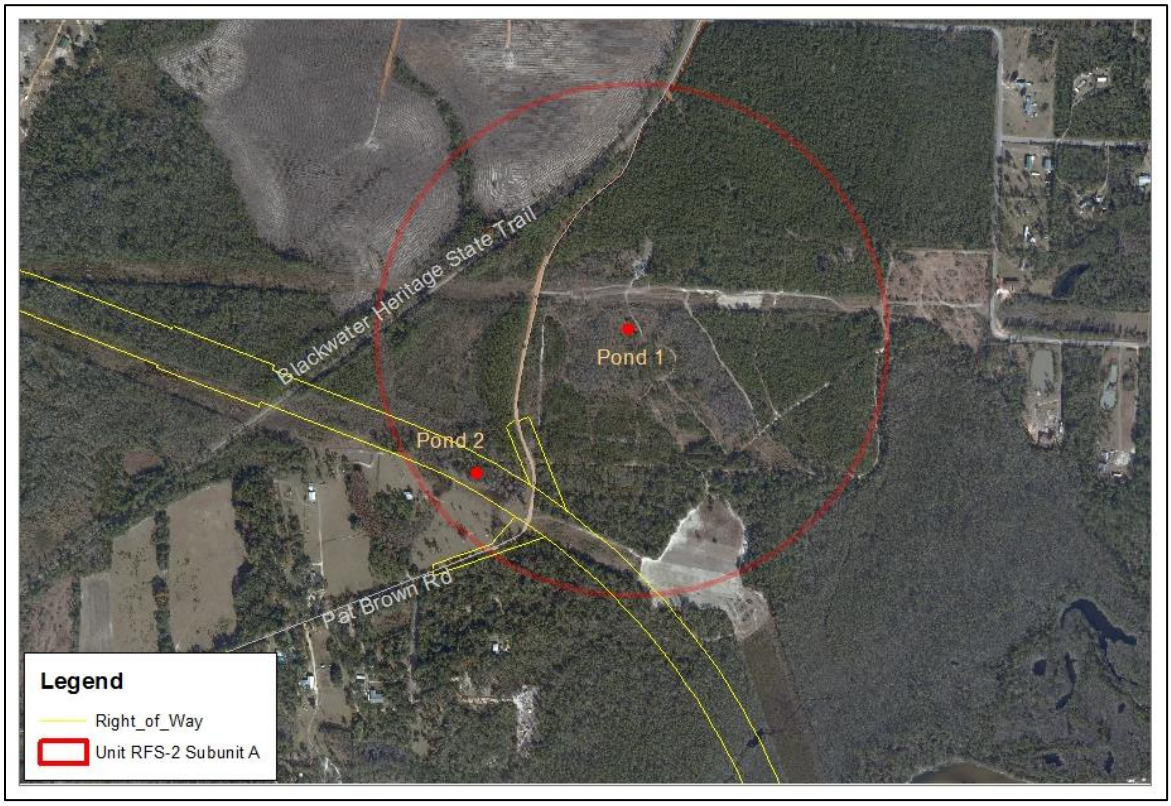

Figure 6. Reticulated flatwoods salamander critical habitat within the Action Area.

1. Breeding habitat:

Pond 1 is centrally located in the unit and at the outer edge of a 1,500-foot buffer of the proposed roadway alignment. It is an approximately 5-acre dome swamp with an overstory of scattered slash pine (*Pinus elliottii*) and pond cypress (*Taxodium ascendens*), and a midstory of myrtle-leaved holly (*Ilex myrtifolia*), pond cypress, and blackgum (*Nyssa sylvatica*). The groundcover is comprised of panic grass (*Dicanthelium* sp.), horned beakrush (*Rhynchospora inundata*), club moss (*Lycopodium* sp.), white top pitcher plant (*Sarracenia leucophylla*), sedges (*Dichromena* sp.), and hog fennel (*Oxipolis* sp.). Historic occurrence of the RFS is known for Pond 1 and they are presumed to be still present.

The overall quality of Pond 1 was Moderate-High based on combined scores for the quality of the pond, ecotone, and surrounding uplands. The pond alone was scored as a "3", or High quality pond. This indicates a pond with an open overstory and midstory canopy (less than 31% crown closure) with abundant, diverse desirable graminaceous groundcover (*i.e*. high species diversity, significant occurrence of tufted or linear growth-form herbaceous species, and limited occurrence, less than 10%, of weedy and/or exotic species) and hydrology indicative of seasonal

inundation, less than one meter in depth.

Pond 2 is an 8.4-acre dome swamp located on the southwest corner of the unit; the entire pond is within the 1,500-foot buffer of the proposed roadway alignment and much is within the 200-foot ROW. Approximately 30% of the pond's canopy has been cleared for a powerline easement. The remaining canopy is comprised of pond cypress and slash pine, with approximately 60% considered open and 10% a moderately closed canopy. Most of the midstory (75%) is open with scattered myrtle-leaved holly. Approximately 25% of the midstory has dense myrtle-leaved holly and gallberry (*Ilex glabra*).

The overall quality of Pond 2 is Low-Moderate based on combined scores for the quality of the pond (2), ecotone (1), and surrounding uplands (1). A pond score of "2" indicates a Moderate quality pond, or a somewhat open overstory/midstory (31 to 70 % crown closure) with sparse desirable, primarily graminaceous groundcover (*i.e*. moderate species diversity, significant occurrence of tufted or linear growth-form herbaceous species, and limited, 10-25% occurrence of weedy and/or exotic species) and hydrology indicative of seasonal inundation.

2. Non-breeding habitat:

By definition, non-breeding habitat is characterized by mesic pine flatwood savannas that are maintained by frequent fires and are located within 1,500 feet of adjacent and accessible breeding wetlands. Crayfish burrows or other underground habitat should be present. Non-breeding habitat includes soils with a spodic horizon which sometimes inhibits subsurface water penetration, resulting in moist soils with water at or near the surface. A groundcover layer dominated by wiregrass is best for supporting the herbaceous invertebrates which are the primary food source.

Within the unit, most of the uplands are planted mesic pine flatwoods. Portions of the uplands have been disturbed by maintained powerline and pasture which has altered native plant communities. Service biologists observed evidence of soil compaction and rutting within the powerline easement during a November 7, 2011, field review. Uplands around Pond 1 transition from planted slash pine into higher elevation sandhills. The upland canopy is dominated by slash pine, turkey oak (*Quercus laevis),* and laurel oak (*Quercus laurifolia*) and a subcanopy of blueberry (*Vaccinium elliotti*) and sweet gallberry (*Ilex coriacea*). Fire suppression has resulted in an increase in canopy and shrub density. The BA indicates that uplands surrounding Ponds 1 and 2 are Low quality, with a score of "1" using the flatwoods salamander habitat assessment. This score indicates slash or sand pine plantation where the wiregrass has been nearly eliminated. The uplands crossed by the current alignment are mostly within the disturbed powerline easement.

3. Dispersal habitat:

Dispersal habitat is the upland area between breeding and non-breeding habitat that allows for movements of the salamander between the areas. These areas should contain a mix of vegetation that transitions between upland and wetland vegetation types (ecotone) with an open canopy and an abundant herbaceous layer. Moist soils and subsurface structure should be present. Ecotone

quality for Pond 1 is "Moderate", with a moderately open mesic-hydric graminaceous ecotone with moderately diverse desirable wiregrass and other graminaceous species adjacent to pond. The ecotone for Pond 2 is "Low" quality with a disturbed (exotic species dominated), narrow, or patchy graminaceous ecotone; low species diversity; or xeric to mesic-xeric conditions. Dispersal may be fragmented around Pond 1 due to the location of an unimproved road (Pat Brown Road), the Blackwater Heritage State Trail, and numerous small forest roads. Upland habitat near Pond 2 has even greater fragmentation with a powerline easement, Pat Brown Road, the Blackwater Heritage State Trail, and small ranchettes of 2 to 10 acres with minimal native vegetation. The road alignment is associated with the poorer quality dispersal habitat near Pond 2.

3.2.3 Factors Affecting the Species' Environment within the Action Area

No other actions affecting the species environment are expected within the Action Area.

4.0 EFFECTS OF THE ACTION

4.1 Factors to be Considered

This section includes an analysis of the direct and indirect effects of the proposed action on the species and critical habitat and its interrelated and interdependent activities. Our analysis of the effect of road and bridge construction considers the following factors:

Proximity of the action: The proposed action will affect designated critical habitat and all life stages of Gulf sturgeon in the Blackwater River because the road crossing is near a major summer holding area and all life stages may pass up- and downstream of the project. It will affect critical habitat unit RFS-2, Subunit A for the reticulated flatwoods which is used by all life stages of the species.

Distribution: The Gulf sturgeon is known to reproduce in seven rivers across its range, and all seven rivers are designated critical habitat. The Yellow River critical habitat unit is in the center of the species' range and comprises 7% of designated riverine critical habitat; however, critical habitat will only be affected in the Blackwater River from 1,500 feet upstream of the bridge to 1.7 miles downstream, to and including Coopers Basin. Therefore, less than 0.1% of designated Gulf sturgeon riverine critical habitat may be affected by the proposed action. The Yellow River subpopulation was estimated to be 1,036 net-vulnerable individuals in 2011, which is about 5-6% of the range-wide Gulf sturgeon estimation. Preliminary estimates in 2013 for population size on the Blackwater River indicates approximately 460-470 total individuals, or 2% of Gulf sturgeon range-wide may be affected.

The RFS occurs in small, isolated areas of suitable habitat widely scattered across its range. The proposed project may affect one of 16 critical habitat units and one of 20 known populations located in Florida and Georgia. The nearest adjacent unit is approximately 10 miles to the east in Blackwater State Forest. The project alignment footprint crosses approximately 8.3 ac, which comprises 5% of Unit RFS-2, Subunit A, and less than 1% of all critical habitat. Within the footprint, only 5.07 ac appear to contain the PCEs for critical habitat. The BA indicates that by

bridging the unit, direct impacts will be reduced to the location of bridge supports, or approximately 0.012 ac of breeding habitat and 0.006 ac of dispersal habitat. No adult population estimates are available for this species, but due to the few individuals encountered at known breeding sites the populations are likely very small.

Timing: The construction letting date for Phase 1 is anticipated to be in late 2025. It is expected that work will be ongoing during periods when sturgeon are present in the Blackwater River. In-river work will avoid the months of May and June, as most sturgeon arrive in the Blackwater River during this period and fish are found higher up in the river (nearer to the proposed bridge location) early in the summer. No spawning is known to occur on the Blackwater River, but fish use the river for resting and staging during the summer.

The RFS may be present throughout the year in the project area in various life stages.

Nature of the effect:

Gulf sturgeon:
Direct impacts may consist of: physical injury, temporary hearing loss, or mortality from underwater sound pressure waves associated with pile driving; crushing or burying individual Gulf sturgeon and their prey species by machinery or sediment deposition; displacement of individuals; and habitat loss due to the addition of in-river structures, increased scour, riparian vegetation removal, decreased woody debris, potential increases in stream temperature, and the addition of fine sediments. Effects from construction may consist of altered water quality, habitat quality, and behavior of Gulf sturgeon within the stream segment. Altered behavior could include increased stress responses and disruption of normal movements due to construction activities (*e.g.* elevated noise, sediment controls or equipment blocking passage, etc.), resulting in lost or reduced recruitment and/or reduced feeding due to construction activities. Elevated levels of fine sediments may affect breathing, feeding, and reproduction. Indirect effects include increased human development along the new alignment with associated loss of riparian habitat; increased boat activity; and a long-term increase in noise and pollution from continual operation of the roadway.

Direct and indirect effects are likely to occur primarily within the Blackwater River from 1,500 feet upstream of the bridge and downstream as far as Coopers Basin (1.7 miles). The zone of elevated noise is expected to be greatest from 600 feet upstream to 1,200 feet downstream of the bridge; at these distances noise levels are expected to be attenuated by major bends in the river. Avoiding in-water pile driving in May and June will greatly reduce their exposure to impacts and the risk of injury. Additional indirect effects may occur beyond the zone of elevated noise. Activities that could cause erosion and sedimentation into the stream could extend over 3,280 feet downstream (Forman *et al.* 2003); however, erosion control measures should reduce these effects to a minimal level with most effects within 1,312 feet (400 meters) downstream of the source (Service 2013b). In addition, road capacity improvement projects can lead to additional development within the watershed and proximate to the Blackwater River and Coopers Basin. The following agreed-upon conservation measures will reduce the direct and indirect impacts from the project: avoiding embankment and excavation, avoiding root raking at the bridge location except where piling caps are anticipated; bridging the riparian floodplain; using Best

Management Practices for OFWs to control erosion, sedimentation, and turbidity; using construction mats within wetland areas to minimize soil disturbance; collecting and treating all stormwater from the bridge surface; and using ramp-up measures during piling installation to allow for a gradual increase in noise levels.

Reticulated flatwoods salamander:
Direct impacts may include: physical injury, mortality, displacement, or disturbance that result from land altering activities during pre-construction and construction such as land clearing, grading, filling, soil disturbance and compaction, pile driving, constructing temporary work platforms and sediment basins; constructing bridge spans; constructing stormwater pond infrastructure; and placement of temporary and permanent access roads. Work activities may also generate increased levels of noise, vibration, and human presence which could disturb and harass the RFS. There is the potential for insufficiently controlled erosion to result in sediment deposition into the breeding ponds, smothering eggs and larvae. Increasing impervious surface and collecting/treating stormwater may alter the unit's hydrology. After construction, noise and vibration from traffic could result in continued disturbance. Road-generated dust, debris, and pollutants may cause cumulative degradation of habitat over time. Habitat degradation may also negatively affect the diversity of available prey species, diminishing the overall health of all life stages. Indirect effects such as disturbance and habitat loss/degradation could result from increased accessibility for human activities (such as recreation) and conversion to more intensive land uses in and adjacent to this privately owned unit. Any direct or indirect effects causing loss or degradation of habitat and altered hydrology will have adverse effects to the PCEs of critical habitat.

Effects may occur throughout the entire critical habitat unit, either directly or indirectly. Direct effects will be concentrated within the alignment's 200-foot ROW in the southwest corner of the unit. Habitat within the alignment includes the Low-Moderate quality Pond 2, and a disturbed powerline easement. Pond 2 is less than 700 feet from the known breeding pond (Pond 1), although an unpaved roadway separates the two ponds. The following measures will be incorporated to reduce potential adverse effects. The original alignment was shifted to the south to avoid Pond 1 and higher quality dispersal and non-breeding upland habitat. The entire section crossing Unit RFS-2, Subunit A will be bridged using pile bent supports to reduce direct impacts. Water quality protection BMPs will be followed. Stormwater ponds will be located outside of RFS critical habitat. Mats will be used during construction to reduce disturbance to soils. Access for construction and maintenance will occur through the powerline easement. Loss of RFS habitat due to direct impact of 0.06 acre of fill and indirect impacts to 8.3 acres will be offset by funding a third party organization for a goal of habitat preservation or restoration that benefit the species' conservation limited to $10,000 (see Conservation Measure #27). By bridging the entire unit, potential future access for development and recreation will be considerably reduced.

Duration: The duration of impacts will be both short- and long-term, although the duration of all work activities has not been determined by FDOT. Work within the Blackwater River channel is expected to be completed in 3 months. The entire project is expected to be completed within 2 years. Some indirect impacts due to the presence of the road will be permanent, resulting from the continuing presence of the road itself. These effects may be both short-term (such as

periodic maintenance activities) and long-term (altered stream hydrology and geomorphology; increased magnitude and frequency of floods and debris flows, etc.). Roads can be a major sediment source throughout their existence. Vehicular traffic is a source of chemical contamination from metals, petroleum products, and occasional toxic spills. Roads may also provide a new access point for human activity, thereby causing the spread of non-native plants, fish and mollusks, and pathogens.

Disturbance frequency: Construction activities will result in a prolonged, one-time disturbance to: critical habitat within the Action Area; the RFS population within Unit RFS-2, Subunit A; and the Yellow River subpopulation of Gulf sturgeon. Underwater noise from pile driving will occur as short-term pulses (*i.e.* minutes to hours), separated by virtually instantaneous and complete recovery periods. These disturbances are likely to occur several times a day for up to 3 months. Water quality impairment will also occur as short-term pulses (*i.e.* minutes to hours) during construction, most likely due to erosion during precipitation events, and will continue due to stormwater runoff for the design life of the bridge. Physical habitat alteration due to modification and replacement of existing in-river and over-water structure also occur intermittently during construction, and will remain as the final, as-built project footprint for the design life of the bridge.

Disturbance intensity and severity: Temporary impacts are expected to occur during the construction phase of the project. Since work for Phase 1 will be two years, the temporary impacts of the proposed action are expected to affect multiple generations of both species. We also expect individual Gulf sturgeon to use the areas in the bridge footprint routinely from late spring into the fall and to recolonize daily if they are temporarily displaced during construction. The intensity and severity of the impacts will be reduced by implementing many of the conservation measures in the proposal. These measures include but are not limited to, the use of environmentally-sensitive bridge construction; using ramp-up measures during piling installation to allow for a gradual increase in noise levels; using BMPs to control erosion, sedimentation, and turbidity; and conveying stormwater to treatment ponds to eliminate run off into streams and wetlands.

4.2 Analysis for Effects of the Action

This analysis will focus on the effects of the proposed work activities on the Blackwater River and its adjacent riparian areas for the Gulf sturgeon, and Critical Habitat Unit RFS-2, Subunit A for the flatwoods salamander. Construction of the new bridge in the river channel will require the placement of one bent within the river, resulting in 68 ft^2 of permanent fill. The bridge will span almost the entire floodplain for the river. Construction of the new bridge within Unit RFS-2, Subunit A, will result in direct, permanent loss of 272 ft^2 of habitat for the pilings. Approximately 1,663 linear feet of bridge will cross RFS critical habitat.

The effects of roads and bridges on aquatic and terrestrial systems have been well-studied and can extend well beyond the project's construction footprint. Actions that may result in impacts to listed species include land clearing and grading, the location of staging/storage areas, the construction of access roads and temporary work platforms, construction of stormwater treatment systems, installation of new bridge spans, lighting, the presence and operation of the facility,

future maintenance activities, and indirect impacts from the ancillary development associated with increased human access.
In-river construction activities result in equipment in the river including boats, barges, pilings, and erosion control materials. Gulf sturgeon are known to jump out of the water and may be struck by boats. Piling installation methods such as pile driving may produce underwater sound at levels that may disturb or injure sturgeon. Erosion control material may impede movements through and around the area; inadequately maintained erosion control structures on land may fail and release sediment into sensitive areas. Stormwater runoff may introduce pollutants which degrade habitat. Improper handling of toxic materials can result in releases that damage habitat or poison animals. Clearing/dredging/filling natural lands may destroy or degrade habitat, and alter hydrology, thereby reducing the quantity and quality of habitat available for necessary life functions. Roadways can be a source of invasive plant species that affect the vegetation community structure and reduce plant diversity. Low plant diversity can in turn reduce the availability of suitable prey base for all life stages of the RFS. Herbicides to control undesirable vegetation are known to negatively affect the health of amphibians. Proximity to roads can also limit a land manager's ability to prescribe burn habitat – thereby increasing canopy and shrub densities to undesirable levels, reducing native groundcover, increasing rates of evapotranspiration, and altering surrounding hydrology.

The rule designating critical habitat for the RFS (74 FR 6700; February 10, 2009) identifies three categories of actions which may affect the ability of critical habitat to serve its intended conservation role for the species, or retain the PCEs' current functional ability. These are actions (including road construction) that: 1. significantly affect water chemistry in breeding ponds; 2. significantly alter the hydroperiod and vegetation of a breeding pond; and 3. significantly alter their terrestrial forested habitat (*i.e.* change soil moisture, soil below-ground structure, soil temperatures, and vegetation so that terrestrial habitat is degraded or eliminated).

The impacts discussed above are all possible; however, the effects that have the greatest potential for impacting listed species and their critical habitat at this location are: elevated levels of underwater noise and reduced water quality (Gulf sturgeon); alteration of breeding pond chemistry, alteration of breeding pond hydrology and vegetation; and alteration of terrestrial forested habitat (RFS).

Underwater Noise and Gulf Sturgeon:

Underwater pile driving produces high sound pressure underwater, which can injure or kill fish (Caltrans 2001; Hastings and Popper 2005; Popper and Hastings 2009). Fish with swim bladders, such as Gulf sturgeon, are particularly sensitive to underwater impulsive sounds with a sharp sound pressure peak occurring in a short interval of time (Caltrans 2001). As the pressure wave passes through a fish, the swim bladder is rapidly squeezed due to the high pressure, and then rapidly expanded as the under pressure component of the wave passes through the fish. The pneumatic pounding may rupture capillaries in the internal organs as indicated by observed blood in the abdominal cavity, and maceration of the kidney tissues (Caltrans 2001). Direct take can occur as instantaneous death, latent death within minutes after exposure, or can occur several days later. Indirect take can occur because of reduced fitness of fish making it susceptible to predation, disease, starvation, or inability to complete its life cycle.

Generally, sound pressures from underwater pile driving depend upon the size of the pile and the size of the hammer. Several other factors can cause large variations in measured sound pressures including water depth, tidal conditions or currents if sound attenuation systems are used, and the geotechnical conditions that determine how difficult it is to drive the pile (Illinworth and Rodkin, Inc. 2007). Underwater pile strike noise is measured in the following ways:

1. Peak sound pressure level (dB_{peak}): the maximum sound pressure level or highest level of sound in a single strike measured in decibels relative to 1 micro-Pascal (dB re 1 μPa) and referred to as dB_{peak}.
2. Sound exposure level (SEL): the integral of the squared sound pressure over the duration of the pulse (e.g., a full pile driving strike.) SEL is the integration over time of the square of the acoustic pressure in the signal and is thus an indication of the total acoustic energy received by an organism from a particular source (such as pile strikes). It is measured in decibels relative to 1 micro-Pascal-squared second (dB re 1 μPa^2-s).
3. Single Strike SEL: the amount of energy in one strike of a pile.
4. Cumulative SEL (dB_{cSEL}): the energy accumulated over multiple strikes. Cumulative SEL indicates the full energy to which an animal is exposed during any kind of signal. The rapidity with which the cumulative SEL accumulates depends on the level of the single strike SEL. The actual level of accumulated energy is the logarithmic sum of the total number of single strike SELs. Thus, dB_{cSEL} = Single-strike SEL + $10\log_{10}(N)$; where N is the number of strikes. This is referred to as $dB_{cSEL.}$
5. Root Mean Square (dB_{RMS}): the average level of a sound signal over a specific period of time. This is referred to as dB_{RMS}.

A multi-agency work group consisting of key technical and policy staff, supported by national experts on sound propagation activities that affect fish and wildlife species of concern, developed criteria for the acoustic levels at which various physiological effects to fish could be expected (FHWG 2008). These criteria apply to all listed fish species on the west coast, including green sturgeon, which are biologically similar to Gulf sturgeon. They determined that to protect listed fish species, sound pressure waves should be within a single strike threshold of 206 dB_{peak}, and cumulative strike sound exposure levels should be less than 187 dB_{cSEL} for fish that are larger than 2 grams and less than 183 dB_{cSEL} for fish that are smaller than 2 grams (FHWG 2008).

NMFS has relied on these criteria in determining the potential for physiological effects in Section 7 consultations conducted on the East and West Coast. At this time, they represent the best available information on the thresholds at which physiological effects to sturgeon are likely to occur. It is important to note that physiological effects may range from minor injuries from which individuals are anticipated to completely recover with no impact to fitness to significant injuries that will lead to death. The severity of injury is related to the distance from the pile being installed and the duration of exposure. The closer to the source and the greater the duration of the exposure, the higher likelihood of significant injury. NMFS has employed a dB_{RMS} pressure level radius in several East and West Coast consultations. At this level, fish may experience a temporary threshold shift in hearing due to a temporary fatiguing of the auditory system that can reduce the survival, growth, and reproduction of the affected fish by increasing

the risk of predation and reducing foraging or spawning success (Stadler and Woodbury 2009). For the purposes of this consultation we also will use the dB_{RMS} threshold of 150 as a conservative indicator of the noise level at which there is the potential for behavioral effects.

The BA for the proposed action uses noise estimates from a Federal Transit Authority study in 2006 to estimate construction noise levels for the project. No information was provided on potential underwater sound pressures from pile driving. Illinworth and Rodkin, Inc. (2007) compiled all available information on underwater sound pressures resulting from pile driving in Northern California since 2000. They reported driving a 0.6 m (24 in) concrete pile at a water depth of approximately 5 m (16.4 ft) resulted in near-source (10 m) sound pressures of 190 dB_{pSPL}, 170 dB_{RMS}, and 160 dB_{cSEL}. We expect threshold levels to be reached over a much shorter distance because noise propagation is limited by the sinuosity of the river. Using a line-of-sight rule (where the sound level is assumed to greatly diminish at the first visual river bend), noise should be abated by within approximately 600 feet upstream and 1,200 feet downstream of the bridge location.

Due to its distance 1.7 miles downstream from work activities, it is unlikely that noise or disturbance will affect the Gulf sturgeon holding area at Coopers Basin. As discussed in Section 3.1.1, our most recent data indicates that Gulf sturgeon use the area immediately around the proposed bridge occasionally during late spring and early summer, with most occurrences from mid-May to mid-June. While no data on expected sound levels are currently available for this project, based on a recent similar project (SR 87 Yellow River bridge FWS # 2013-F-0033) we do not expect sound levels to exceed standard thresholds for injury or death during pile driving. However, we do expect disturbance effects to Gulf sturgeon to result from levels in excess of 150 dB_{RMS} (Caltrans 2009) but below injury thresholds. A sound study is expected to be completed for SR 87 Yellow River bridge prior to construction. This information will be useful during the future re-evaluation of this project.

Sound pressure levels in excess of the disturbance threshold (but below the threshold for injury) are expected to cause temporary behavioral changes that will increase the risk that those individuals will be subject to predation and cause stress that could reduce their likelihood of foraging or future spawning success. We expect the behavioral response of Gulf sturgeon would be to move to areas outside of the noise threshold, leading to increased energy expenditures. It is possible that the noise would cause Gulf sturgeon to avoid the project area. The conservation measure of ramping-up noise levels may also reduce impacts to Gulf sturgeon. During the construction of the Woodrow Wilson Bridge over the Potomac River, there is evidence that tapping the pile with lower energy for the first few strikes may cause fish to move away from the piles before full operations begin (FHWA 2003); however, these findings were anecdotal and were not part of scientifically controlled studies.

Reduced Water Quality for Gulf Sturgeon:

Road and bridge construction commonly result in increased sedimentation in riverine environments. Sediment and contaminants are likely to be released into the water by construction activities that are part of the proposed action, including geotechnical surveys, excavation, grading, filling, pile driving, and in-river work that is necessary to rehabilitate or

construct the road and bridges, and to construct and maintain the stormwater facilities. Soil disturbance will increase the rate at which wind and water erosion will carry sediment into the Blackwater River. Pile installation will also disturb the sediments in the footprint and result in some re-suspension of material into the water column. However, because pile occupies a small area of primarily sandy substrates that are often rearranged by river currents, any increase in turbidity will likely be small.

Contamination of sediment from the project area is probable from runoff and automobile releases. Discharge of stormwater runoff from contributing impervious area associated with the proposed action will also add to a variety of pollutants to Blackwater River that originate directly from automobiles and indirectly via aerial deposition from industrial and agricultural production. These pollutants will include, but are not limited to, nutrients, metals (arsenic, copper, chromium, lead, mercury, and nickel), PAHs, sediment, and pesticides (Buckler and Granato 1999; Colman *et al*. 2001; Kayhanian *et al*. 2003). Nutrients and other oxygen demanding substances in stormwater lower oxygen levels in receiving waters and may lead to oxygen depletions. Additionally, the use of heavy construction equipment results in small, unpredictable releases of fuel, lubricant, and hydraulic fluids. The release of construction material, though minor, is likely to occur as well (grinding slurry, concrete, and rubble).

The FDOT proposes to capture, manage, and treat stormwater in stormwater retention ponds. Ponds associated with the Blackwater River will be treated to OFW standards. The number and placement of ponds has yet to be finalized. Two proposed ponds (Ponds 1-3 & 1-5) are located near Coopers Basin but discharge indirectly via overland flow into the upper Blackwater River.. The proposed stormwater treatment will not eliminate all stormwater pollutants. Thus, some adverse effects of stormwater runoff will exist for the design life of the road and bridge crossing.

The Gulf sturgeon and its critical habitat are likely to be affected by reduced water quality through increased sedimentation and contamination associated with road and bridge construction and stormwater discharge. Sedimentation from soil disturbance in and near the river may interfere with proper respiratory functioning, smother in-stream habitat and reduce the prey base for YOY and juvenile Gulf sturgeon, and reduce channel capacity. Loss of channel capacity leads to greater bank erosion, channel widening, increased temperatures and other alterations adverse to the Gulf sturgeon. However, the erosion control plan should reduce the potential for impacts to Gulf sturgeon and its critical habitat. Although little is known about contaminant effects directly on Gulf sturgeon, specific impacts of pollution and contamination on other sturgeons have been identified to include muscle atrophy, abnormality of gonad, sperm and egg development, morphogenesis of organs, tumors, and disruption of hormone production (Graham 1981; Altuf'yev *et al*. 1992; Dovel *et al*. 1992; Georgi 1993; Romanov and Sheveleva 1993, Heath 1995; Khodorevskaya *et al*. 1997; Kruse and Scarnecchia 2002). However, due to stormwater treatment, and the relatively small amount of time that any heavy equipment will be in the water and the use of proposed conservation measures, any increase in contaminants is likely to be small and infrequent.

Altered Flatwoods Salamander Breeding Pond Water Chemistry

Chemical pollutants associated with roads can be diverse and come from a variety of sources

such as oil, grease, hydraulic fluids, engines, metal plating, rust, tire wear, fuel and exhaust, road surface wear, and herbicide and pesticide use (Forman *et al*. 2003). Pesticides and herbicides are a threat to amphibians such as flatwoods salamanders. The permeability of their skin and eggs can easily absorb chemicals present in their surrounding environment (Duellman and Trueb 1986). In frogs, pesticides used for agriculture are known to cause deformities, reduce survival rates, and cause tadpole mortality (Sanders 1970). Other effects of pesticides on amphibians include delayed metamorphosis, paralysis, and slower rates of growth (Bishop 1992). Herbicides may also impact flatwoods salamanders by: altering the density and species of the plant community at breeding pond locations, and reducing the available sites for egg deposition, larval development, or shelter for migrating adults and post-metamorphic salamanders. Aerial spraying as an application technique heightens the detrimental effects of herbicides (Tatum 2004). Low-levels of chemical pollutants are expected for the lifetime of the project.

Wetland water quality is also necessary to maintain the aquatic fauna that are the food source for larval salamanders. Chemicals and sediment associated with road runoff can reduce the availability of flatwoods salamander prey base. Work by Gillespie (2002) showed that an increased sediment load significantly reduced tadpole growth and development, apparently by impairing food quality. Instances of heavy sedimentation have been linked to a reduction in salamander diversity (Brannon and Purvis 2008). Fill material used in road construction may also be chemically distinct from native soils. Collecting all stormwater runoff from the bridge surface and treating within ponds located outside of the critical area will greatly reduce the potential detrimental effects of chemical pollutants. There is the potential that in the future herbicides may be used during maintenance activities to reduce growth of vegetation under the bridge or to eliminate invasive species.

Altered Flatwoods Salamander Breeding Pond Hydroperiod and Vegetation

Breeding pond hydrology is closely tied to the unit's topography, land use, soils, and rainfall patterns. Activities that compact soils, alter soil composition, change topography, create hydrologic barriers, channel and redirect flow, or alter the composition of vegetation may have an effect on the pond's hydrology and/or hydroperiod. Flatwoods salamanders are highly sensitive to changes in hydrology, which may be compounded during periods of drought (Palis *et al.* 2006). Breeding ponds must be inundated for eggs to hatch, and remain wet for the 3 to 4-month larval period. Increases to impervious surface can alter hydrology by reducing infiltration, increasing runoff, and redirecting flow. Ditching to manage and direct runoff can inadvertently connect flatwoods salamander breeding ponds to more permanent waters and allow invasion by predatory fish. By providing a new road in this area, ancillary development may occur along unbridged sections of the alignment that could further increase impervious surface in the basin. One result of increased impervious surface can be a direct loss of habitat, as well as a decreased recharge of the water table coupled with a corresponding decline in base flows (Shuster *et al.* 2005).

Prescribed burning is a necessary component for restoring/enhancing flatwoods salamander habitat and maintaining an open canopy and diverse groundcover. Concerns about smoke management will affect future land manager's ability to prescribe burn and reduce the suitability of the site for species recovery land acquisition. Lack of burning could lead to an increase in

woody shrubs, and may alter the evapotranspiration regime by either increasing the loss of water to the atmosphere or increasing uptake which lowers the water table. While Unit RFS-2, Subunit A will be bridged, some alteration in hydrology and vegetation may occur within the unit.

Altered Flatwoods Salamander Terrestrial Forested Habitat

Most of the terrestrial forested habitat within the alignment has been affected by previous land uses (powerline easement, unimproved road). Indirect effects of the new connector road may result in new urban development within this privately owned unit and result in the loss or degradation of terrestrial habitat. The location of the road and the potential for new development may result in a reduced ability to prescribe burn within the unit. Fire is needed to maintain the desired open canopy and diverse groundcover for functional non-breeding habitat. Fire suppression is a threat identified for special management consideration in the final listing rule (Service 2009).

4.3 Species Response to the Proposed Action

Effects to Gulf Sturgeon

While the use of the conservation measures described above should greatly reduce direct impacts to individual Gulf sturgeon and critical habitat, there is risk of some mortality along with displacement of fish for the approximate 30 days that in-river work will take place. Mortality may result from boat strikes, construction debris, equipment movement, muck removal, placement of fill, sedimentation, and/or as the result of pile-driving of bridge piers. Displacement will result from disturbance and noise. Direct impacts of mortality or displacement and indirect effects from elevated noise associated with pile driving would be most likely to occur within the radius of underwater noise that will be created by impact pile driving, which is approximately 600 feet upstream and 1,200 feet downstream of the bridge. Indirect effects from reduced water quality can occur from the bridge crossing up to 3,280 feet downstream (Forman *et al*. 2003). Based on recent erosion control failures during construction of the Mid-Bay Connector Road in Okaloosa County, Florida, the greatest effects from sedimentation are expected to be concentrated within 400 meters (1,312 feet) of a failed erosion control structure (Service 2013b).

The proposed action would result in a prolonged (up to 2 years), temporary disturbance to Gulf sturgeon within the Action Area. Direct and indirect impacts are expected to be greatest during the bridge construction phase of the project and for the 3 months of in-river construction. Although approximately 30% of the Yellow River subpopulation of Gulf sturgeon use the Blackwater River, much fewer fish move as far upriver as the project location. Three tagged fish were detected at Big Eddy, just upstream of the bridge crossing, with each tag representing approximately 10 fish. All of these individuals have the potential to be affected by the proposed project; however, we do not expect impacts to be substantial on a population level. In general, the proposed project will result in additional boat traffic and potential for interaction between boats and equipment and Gulf sturgeon in the river. Given the small increase in boat traffic, the slow speeds that these boats are expected to operate at, the risk of boat and equipment strikes is not high, and we expect few interactions. We cannot quantify the number of individuals that

may be directly taken through interactions with boats or equipment or the number of individuals indirectly affected by elevated noise from pile driving, because it depends on the number of individuals in the area of impact, which varies widely based on time of year and habitat condition. Potential impacts to feeding are expected to be minimal because YOY sturgeon are not present in the system, and invertebrate food sources for any potential juveniles are available in the Blackwater River. Effects of sedimentation and contamination will be greatly reduced through the use of stormwater treatment ponds which avoids impacts within Coopers Basin and an effective erosion control plan.

Effects to Gulf Sturgeon Critical Habitat

The proposed action has the potential to affect the following PCEs of critical habitat in the Blackwater River: 1) food items, 2) riverine aggregation areas, 3) water quality, 4) sediment quality, and 5) safe and unobstructed migratory pathways. These impacts will be temporary and have the greatest potential to occur during bridge construction. Impacts to water quality, sediment quality, and food resources could occur from sedimentation and contamination; however, any impacts will be greatly reduced through the use of stormwater treatment ponds and an effective erosion control plan. Riverine aggregation areas and safe and unobstructed migratory pathways both have the potential to be affected by elevated noise from pile driving and displacement from other construction activities. These impacts are also reduced through the use of conservation measures described above. None of the impacts are expected to permanently modify PCEs of the designated critical habitat.

Effects to Reticulated Flatwoods Salamander

While the use of the conservation measures described above should reduce direct impacts to individual RFS and their habitat, mortality and injury may occur for any individuals within the proposed alignment ROW for up to the 2-year duration of the project. Mortality and injury may result from movement of construction equipment, placement of fill, sedimentation, and/or as the result of pile-driving of bridge piers. Displacement may result from the loss of breeding, non-breeding, and dispersal habitat. Direct impacts of mortality or displacement would be most likely to occur within the 200-foot ROW. Appropriate erosion control measures will be in place to confine potential sedimentation to within the ROW.

The proposed action would result in a prolonged (up to 2 years), temporary disturbance to RFS during bridge construction within the Action Area. All life stages of the flatwoods salamander may be affected by the proposed work as a potential breeding pond as well as terrestrial habitat are present within the ROW; however, we do not expect impacts to be substantial on a population level as most impacts are confined to low to moderate quality habitat. In general, the proposed project will include activities that degrade or destroy habitat potentially occupied by the RFS such as clearing native vegetation, compacting soils within access roads, movement of heavy equipment, pile driving, and increased human activity. We cannot quantify the number of individuals that may be directly taken through these activities, as the RFS spends the majority of its life cycle underground. The early life stages of the RFS within the breeding ponds are most vulnerable to impacts (from egg to metamorphosis); they are also difficult to detect during this period. Prey availability is likely to be indirectly affected due to degraded habitat conditions. As

most RFS movements are within 1,500 feet of breeding ponds, the RFS cannot readily access other locations for feeding. Bridging should greatly reduce effects to the RFS and its habitat by avoiding extensive soil compaction and paving. We expect the effects of sedimentation and contamination to be greatly reduced through the use of stormwater ponds outside of RFS habitat and an effective erosion control plan.

Effects to Reticulated Flatwoods Salamander Critical Habitat

The proposed action has the potential to affect the following PCEs of Critical Habitat Unit RFS-2, Subunit A: 1. breeding habitat; 2. non-breeding habitat; and 3. dispersal habitat. Impacts to all habitat types could occur directly from sedimentation, soil compaction, contamination, shading; and fire suppression; however, any impacts will be greatly reduced through the use of bridging, avoiding the known RFS breeding pond and higher quality uplands, treating stormwater off-site, and implementing an effective erosion control plan. Impacts to the potential breeding pond (Pond 2) are expected to diminish the pond's overall quality but not to completely eliminate its function. Within the unit, permanent impacts from the bridge supports will result in a loss of 0.06 ac or 0.03% of critical habitat in the Action Area; approximately 8.3 ac of critical habitat (5% of Unit RFS-2, Subunit A, and 0.19% of all critical habitat) will be traversed by the footprint of the alignment and degraded both directly and indirectly by construction activities and the continued presence of the bridge.

4.4 Interrelated and Interdependent Actions

Along with the effects of the action, we must consider the effects of other federal activities that are interrelated to, or interdependent with, the proposed action (50 CFR sect. 402.02). Interrelated actions are part of a larger action and depend on the larger action for their justification. Interdependent actions have no independent utility apart from the proposed action. At this time, the Service is unaware of actions that satisfy the definitions of interrelated and interdependent actions that will not themselves undergo section 7 in the future, or that are not already included in the Baseline.

5.0 CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any specific plans within the Action Area that would not be covered under section 7.

6.0 CONCLUSION

Gulf Sturgeon

Our analysis indicates that the proposed project would have a negative, but not appreciable effect on the survival and recovery of Gulf sturgeon. Most direct and indirect effects will occur within the radius of underwater noise that will be created by pile driving and the downstream distance

associated with potential erosion control failures; however, overall the effects are considered small, temporary and reversible. Given that the subpopulation of Gulf sturgeon in the Yellow River (including the Blackwater River) is stable or increasing, the probability of species extinction is low. In addition, the proposed project is not likely to appreciably diminish the critical habitat's capability to provide the intended conservation role for the Gulf sturgeon. The nature of effects to critical habitat is relatively small, dynamic, and should not produce permanent alterations to any PCE.

After reviewing the current status of the Gulf sturgeon, the environmental baseline for the Action Area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the proposed new SR 87 Connector Road and construction of a new two-lane bridge is not likely to jeopardize the continued existence of the Gulf sturgeon or destroy or adversely modify its designated critical habitat.

Reticulated Flatwoods Salamander

Our analysis indicates that the proposed project would have a negative, but not appreciable effect on the survival and recovery of the reticulated flatwoods salamander. Most impacts will be short-term and temporary but there will be some permanent loss of habitat. The placement of piling bridge supports will result in the loss of 0.06 ac of habitat. Some indirect effects (shading, fire suppression, contaminant source) will be small but continual due to the long-term presence of the roadway. Up to 5% of the critical habitat in the unit will experience some degree of long-term impact. Effects are limited to an area with existing impacts from a powerline easement and unimproved roadway. None of the impacts are expected to alter the unit's PCEs to such an extent that the conservation role of the critical habitat to support a viable core population is appreciably diminished.

After reviewing the current status of the reticulated flatwoods salamander, the environmental baseline for the Action Area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the proposed new SR 87 Connector Road and construction of a new two-lane bridge is not likely to jeopardize the continued existence of the flatwoods salamander or destroy or adversely modify its designated critical habitat.

This opinion will apply for 5 years; after 5 years a re-evaluation of this opinion is required to address potential changes in the species' status. This re-evaluation is expected to take place at the beginning of the ROW phase.

7.0 INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to

listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering [50 CFS §17.3]. Incidental take is defined as take that is incidental to, and not the purpose of, an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FDOT so that they become binding conditions of any contract, grant or permit issued by the FHWA, as appropriate, for the exemption in section 7(o)(2) to apply. FHWA and FDOT have a continuing duty to regulate the activity covered by this incidental take statement. If FHWA and FDOT: (1) fail to assume and implement the terms and conditions or, (2) fail to require any contracted group to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FHWA and FDOT must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(I)(3)]

7.1 Amount Or Extent Of Take Anticipated

Gulf Sturgeon

Incidental take is expected to be in the form of temporary direct and indirect impacts resulting from construction activities, elevated noise levels, impaired water quality, and habitat degradation. While injury or mortality of individuals is possible, the risk will be reduced by the use of environmentally-sensitive bridge construction techniques, and conservation measures that minimize impacts of pile driving noise, erosion, and ground disturbance. As described above (Effects of the Action), we cannot quantify the total number of individuals that may be directly or indirectly affected by the proposed action because it depends on the number of individuals in the area of impact, which varies widely based on time of year and habitat condition. Therefore, take cannot be accurately quantified as the number of individual Gulf sturgeon that are reasonably certain to be harassed, injured or killed by construction activities (other than boat strikes), or indirectly impacted through habitat degradation. We instead consider take in terms of habitat as follows:

1. *Pile Driving*: Take will occur in the area affected by the radius of underwater noise that will be created by impact pile driving, which is approximately from 600 feet upstream to 1,200 feet downstream beyond the 200-foot bridge work area. This includes behavioral disturbance, or auditory effects due to impulse sound from impact driving when the dB_{RMS} sound pressure level exceeds 150 re 1 μPa^2 but is below the threshold for physical injury. We do not anticipate take of more than one fish mortality will occur within this area as a result of boat or equipment strikes associated with in-river construction.

2. *Reduced Water Quality*: Take caused by reduced water quality due to construction activities and stormwater is reasonably certain to occur from the bridge crossing to the downstream extent of the Action Area. The best available indicators for the extent of

take due to reduced water quality are evidence of turbidity released during construction. This variable is proportional to the amount of construction-related disturbance of upland and stream channel habitats that results in an erosion and suspended sediment in runoff and the water column. We anticipate that these effects should not result in visible deposition of new sediment more than 1,312 feet (400 meters) downstream from the limits of construction.

Thus, combining the extent of take from 1 and 2 above, Gulf sturgeon take in the form of physical harm, mortality, or harassment is expected to include the following linear measurement of habitat in the Blackwater River: 600 feet upstream of the ROW; the 200-foot ROW; and 1,312 feet downstream of the ROW. Table 3 summarizes expected take below. The Service concludes that the incidental take of Gulf sturgeon will be considered to be exceeded if there is more than one fish mortality and if visible evidence of new sediment deposition from the project occurs more than 1,312 ft downstream.

Reticulated Flatwoods Salamander

The Service anticipates that incidental take (harm, harass, kill) is expected as a result of the construction activities within the footprint of the 200-foot ROW. While injury or mortality of individuals is possible, the risk is reduced by locating the alignment outside of the known breeding pond and within previously disturbed areas, elevating the roadway by bridging the critical habitat unit, using matting to prevent soil disturbance, avoiding placing stormwater ponds and staging/storage areas within the unit, and adhering to erosion control BMPs. We cannot quantify the number of individuals that may be directly or indirectly affected by the proposed action because of the difficulty in detecting this species either in its larval form or as a subterranean adult. Therefore, take cannot be accurately quantified as the number of individual RFS that are reasonably certain to be injured or killed, or indirectly impacted through habitat degradation. We instead consider take in terms of habitat acreage. Take may occur in the form of physical harm, mortality, or harassment of all life stages within the extent of the 200-foot ROW that crosses Unit RFS-2, Subunit A, or 8.3 acres, as summarized in Table 3 below. The Service concludes that the incidental take of reticulated flatwoods salamander will be considered to be exceeded if new sediment deposition occurs beyond the limits of the 200-ft ROW.

Table 3. The habitat area and associated individuals affected by the proposed project, based on the best available commercial and scientific information.

Species	***Habitat***	***Individuals***	***Take Type***
Gulf sturgeon	2,112 linear feet	*All adult and juvenile sturgeon within the habitat area that may be harmed or harassed by pile driving, construction work activities, and increased turbidity levels. One adult sturgeon may be killed by boat or equipment strikes.*	*Harm, Harass, or Kill*
Reticulated flatwoods salamander	8.3 acres	*All eggs, larvae, post-metamorphic salamanders, and adults within the habitat area that may be harmed, killed, or harassed by construction work activities and degradation of their habitat.*	*Harm, Harass, or Kill*

7.2 Effect Of The Take

In the accompanying biological opinion, the Service determined that this level of anticipated take will not result in jeopardy to the species or destruction or adverse modification of designated critical habitat. Measures to reduce potential impacts to the Gulf sturgeon, reticulated flatwoods salamander, and their critical habitat have been incorporated into the plans for this road construction project.

7.3 Reasonable And Prudent Measures

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the incidental take of Gulf sturgeon, reticulated flatwoods salamander, and their critical habitat as a result of constructing the SR 87 Connector Road. Each RPM will be implemented by associated terms and conditions given in the section to follow. FHWA, as the lead federal agency, shall assure that the following reasonable and prudent measures, with their associated terms and conditions are implemented by the FDOT and their contractor.

RPM 1: Gulf sturgeon and reticulated flatwoods salamander protection, and habitat protection and restoration procedures to minimize impacts from all the construction and maintenance activities shall be implemented.

RPM 2: Ensure that the terms and conditions are accomplished and completed as detailed in this incidental take statement including completion of reporting requirements.

7.4 Terms and Conditions

In order to be exempt from the prohibition of section 9 of the Act, FHWA must ensure that the FDOT and their contractors comply with the following terms and conditions, which implement the preceding reasonable and prudent measures. All conservation measures described in the BA and listed above (Section 1.3) are hereby incorporated by reference as terms and conditions within this document pursuant to 50 CFR § 402.14(I) with the addition of the following terms and conditions. All terms and conditions are non-discretionary.

RPM 1

1.1 The FDOT will provide an information package at the Pre-Construction Conference to educate the Contractor on the subject of the listed species, the laws protecting such species, and the civil and criminal penalties for harming, harassing, or killing such species.

1.2 The Contractor will consider and implement where practical innovative, environmentally sensitive construction techniques to avoid/minimize impacts to listed species and sensitive areas.

1.3 *Construction Special Provisions - Gulf Sturgeon Protection Guidelines (September 2012)*

will be implemented during the construction of this project. See Appendix B.

1.4 The Erosion Control Plan/Stormwater Pollution Prevention Plan (SPPP) will be provided to the Service for comment prior to the start of work. Substantive changes to the SPPP during construction will also be reported to the Service.

1.5 The Erosion Control Plan/SPPP will be strictly adhered to, including the installation and maintenance of structures. Temporary erosion control devices will be installed prior to clearing and grubbing activities. Other measures in the plan will include:

1.5.1 All turbidity barriers placed in the river will be consistent with the *Gulf Sturgeon Protection Guidelines*.

1.5.2 Stockpiled materials will be placed in a manner to prevent rain runoff from washing materials into the river.

1.5.3 The Erosion Control Plan will include redundant measures for the width of the ROW along the Blackwater River and along the limits of construction within the flatwoods salamander critical habitat unit to provide a second line of defense should one layer of protection be breached. An example would be a double row of silt fencing.

1.5.4 The Erosion Control Plan will include daily monitoring of erosion control devices that protect the waters of the Blackwater River and the flatwoods salamander critical habitat unit.

1.6 Soil disturbing activities (clearing, pile driving) within the potential breeding pond (Pond 2) of the flatwoods salamander critical habitat unit will be avoided to the extent practicable during periods when eggs/larvae may be present (October through April). Additional coordination will occur during the Design phase to address this issue.

1.7 In the event of erosion control failure with impacts to the Blackwater River, the Contractor will notify the FDOT, FHWA, and Service to determine: (1) whether incidental take was exceeded, (2) if additional protection measures are needed to avoid future impacts to listed species from sedimentation, and (3) if stream restoration is needed. The Service will be available to assist the FDOT with development of a stream restoration plan should it become necessary.

1.8 Survey the baseline stream geomorphology 400 m downstream of the extent of construction through methods including a longitudinal profile and stream channel cross-sections. Coordinate the survey plan with the Service prior to implementation.

1.9 The Stormwater Management Plan with the final locations of stormwater treatment ponds will be provided to the Service for review prior to finalizing the plan. Siting ponds with direct hydrologic connections to Coopers Basin will be avoided to the extent possible. If these locations cannot be fully avoided, the pond design will include measures to reduce

the risk of contaminants being discharged into Coopers Basin and evidence of such will be provided to the Service.

1.10 Stream turbidity will be monitored by the Project Administrator or his designee before construction in various places on the river (upstream, downstream, etc.) to establish a baseline. During construction and demolition, the Project Administrator will be responsible for monitoring turbidity levels daily for any earthwork activities near the Blackwater River to ensure that turbidity levels do not increase above the level allowed by the FDEP permit for an OFW. Construction activities found to be associated with the increased turbidity levels will not be allowed to resume until the turbidity levels return to that of ambient. All other construction activities having no effect on the deviant turbidity levels will be allowed to resume once the source has been identified.

1.11 Boats and barges used in support of construction activities will be removed from the main channel during periods of inactivity.

1.12 A post-construction field review will be conducted by FDOT and the Service to determine if the project has impacted the Blackwater River and if stream restoration is needed.

1.13 No herbicides or pesticides will be used within the flatwoods salamander Critical Habitat Unit RFS-2, Subunit A during construction and post-construction for FDOT maintenance activities.

1.14 The hydrology and native vegetation of the potential breeding pond (Pond 2) within the FDOT ROW will be maintained to the extent practicable. The pond's plant community and hydrology will be monitored for 5 years to better assess the long term adverse effects of the bridge. A monitoring plan will be developed and coordinated with the Service prior to construction. Annual monitoring reports will be provided to the Fish and Wildlife Service's Field Office in Panama City, Florida

1.15 Conservation measures and best management practices outlined in the BA and these terms and condition shall be included as enforceable provisions of the construction contract. Failure to comply with all applicable conservation measures outlined in the BA, unless they conflict with provisions in these terms and conditions, and all terms and conditions included here may invalidate protective coverage of ESA section 7(o)(2) regarding the incidental take of listed species.

RPM 3

3.1 Upon locating a dead, injured, or sick individual of an endangered or threatened species, FDOT will notify the Fish and Wildlife Service Law Enforcement Office, Groveland, Florida at (352) 429-1037 within 24 hours, and the Fish and Wildlife Service's Field Office at Panama City, Florida at (850) 769-0552 within 48 hours. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

3.2 A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Project Leader, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida, 32405, within 60 days of the completion of construction. This report shall include the dates of work, assessment and actions taken to address impacts to the Gulf sturgeon and flatwoods salamander, if they occurred.

8.0 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by conducting conservation programs for the benefit of endangered and threatened species. Towards this end, conservation recommendations are discretionary activities that an action agency may undertake to minimize or avoid the adverse effects of a proposed action, help implement recovery plans, or develop information useful for the conservation of listed species.

1. To reduce the risk for secondary population growth around Coopers Basin, and to provide protective measures to this important sturgeon summer holding area, we recommend that opportunities for wetland preservation, restoration, and enhancement be considered that would benefit the basin.

2. The known flatwoods salamander breeding pond within the privately owned critical habitat Unit RFS-2, Subunit A, faces the threat of continued degradation due both to lack of management and the risk of a future land use change to urban development. The risk of development will be heightened by its proximity to the new connector road. When compensating for the loss of RFS habitat (Conservation Measure #27), we recommend that the FDOT give priority consideration to the acquisition (fee simple or by conservation easement) first to this unit, and then to other privately owned critical habitat units.

9.0 REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the BA. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information shows that the action may affect listed species in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. This biological opinion was formulated by evaluating the effects of the action within the next five years. A re-evaluation of this opinion is required after 5 years, and should be coordinated with the Service at the beginning of the ROW phase.

We appreciate the cooperation of FHWA, and FDOT and their consultants in preparing this Biological Opinion. We look forward to working closely with you in implementing its provisions and other conservation actions for the Gulf sturgeon and reticulated flatwoods salamander. Please contact Ms. Mary Mittiga at ext. 236 for questions/comments on this consultation.

Sincerely,

Dr. Donald W. Imm
Project Leader

cc: (electronic copies)
ACOE, Panama City, FL (Melinda Witgenstein)
FDOT, District 3, Chipley, FL (Peggy Kelley)
FHWA, Tallahassee, FL (Joseph Sullivan)
FWC, Tallahassee, FL (Ted Hoehn, Jeffrey Wilcox, David Cook)
FWS, Tallahassee, FL (Jerry Ziewitz)
NMFS, St. Petersburg, FL (Dave Rydene)

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APPENDIX A

SR 87 New Connector Road

Conservation Measures for the

Eastern Indigo Snake and West Indian Manatee

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site without interference.
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate U.S. Fish and Wildlife Service (USFWS) office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

Killing, harming, or harassing indigo snakes is strictly prohibited and punishable under State and Federal Law.

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

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PROTECTION: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

August 12, 2013

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

Note: Measures c and f are not required in Santa Rosa County.

APPENDIX B

Construction Special Provisions

Gulf Sturgeon Protection Guidelines

September 2012

CONSTRUCTION SPECIAL PROVISIONS
GULF STURGEON PROTECTION GUIDELINES
(PURSUANT TO NMFS AND USFWS)

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is listed under the Endangered Species Act as threatened. It is managed under the joint jurisdiction of the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Potential habitat for the Gulf sturgeon is located within the limits of this project.

The following special provisions will be incorporated into any construction contract where involvement with sturgeon may occur:

The FDOT has coordinated with the NMFS and USFWS early in the project development stage. The following provisions are intended to avoid/ protect known spawning habitats, nursery areas, feeding areas and thermal refuges.

1. The Florida Department of Transportation (FDOT) shall advise all FDOT project personnel and Contractor personnel on the project that there are civil and criminal penalties for harming, harassing or killing sturgeon. The FDOT and the Contractor will be held responsible for any sturgeon harmed, harassed, or killed as a result of the project activity.

2. The FDOT shall provide information to all FDOT and Contract personnel for identification of sturgeon.

3. Appropriate work shift personnel will be instructed in the appearance, habits, biology, migratory patterns, and preservation of sturgeon. At least one of these trained personnel will be on site during construction activities to maintain a constant surveillance for these species, assure the cessation of activities (such as dredging, excess turbidity, and construction barge activity), which may endanger these species, and assure that uninhibited passage for the animals is provided.

4. Post signs on site warning of the presence of sturgeon, of their endangered status and federal protection, and precautions needed.

5. Turbidity from construction activity will be adequately controlled to prevent degradation of the quality and transparency of the water. When sturgeon are present, turbidity curtains of appropriate dimension will be used to restrict the animals' access to the work area. Pollution booms or turbidity curtains should use tangle resistant or hemp rope when anchoring, or employ surface anchors' to prevent entangling sturgeon. Continuous surveillance will be maintained in order to free animals which may become trapped in silt or turbidity barriers.

6. No dredging of the river bottom will be conducted for barge access.

7. Drilled shaft pile construction will be used whenever prudent and feasible as determined by FDOT.

8. Care shall be taken in lowering equipment or material below the water surface and into the stream bed. These precautions will be taken to ensure no harm occurs to any sturgeon which may enter the construction area undetected.

9. Construction debris shall not be discarded into the water.

10. If the use of explosives is necessary, the following protection measures will be employed for projects in FDOT's District 3

    a. In riverine areas:
        - No blasting will occur in known spawning, staging, feeding, or nursery areas.
        - In-water explosive work should be avoided between the months of April to October.
        - If explosive work becomes necessary within the April to October time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.

    b. In estuarine areas:
        - No blasting will occur in known spawning, staging, feeding, or nursery areas.
        - In-water explosive work should be avoided between the months of October to April.
        - If explosive work becomes necessary within the October to April time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.

    c. In the event that a sturgeon is killed during blasting, the NMFS and the USFWS will be notified immediately.

    National Marine Fisheries Service
    by email at:
    takereport.nmfsser@noaa.gov

    US Fish and Wildlife Service
    1601 Balboa Ave.
    Panama City, Florida 32405
    Tel: (850) 769-0552

11. Any sturgeon carcass will be secured on site or held in a freezer until an agency representative arranges for its transport for analysis.

12. Following completion of the project, a report summarizing any involvement with sturgeon will be prepared for USFWS and NMFS.

Florida Fish and Wildlife Conservation Commission

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MyFWC.com

December 13, 2013

Ms. Mary A. Mittiga
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City, Florida 32405
Mary_Mittiga@fws.gov

Re: U.S. Fish and Wildlife Service Draft Biological Opinion, SR 87 New Connector Road, Santa Rosa County, Florida

Dear Ms. Mittiga:

Florida Fish and Wildlife Conservation Commission (FWC) staff has reviewed the U.S. Fish and Wildlife Service's (Service) draft biological opinion (BO), dated November 25, 2013 and provides the following comments in accordance with the Fish and Wildlife Coordination Act for your consideration. This draft BO is for the Federal Highway Administration/Florida Department of Transportation (FDOT) on constructing a new State Road (SR) 87 connector road in Santa Rosa County, Florida.

Proposed Action

The FDOT District 3 proposes to construct a new two-lane (Phase 1) SR 87 connector road from SR 87S at US 90 east of Milton to SR 87N north of Milton in Santa Rosa County, Florida. The new connector is proposed to improve north-south connectivity for hurricane evacuation, enhance movement of freight, and provide additional traffic capacity. The two proposed alternative routes are of similar length (7-8 miles) and cross designated critical habitat for the Gulf sturgeon and reticulated flatwoods salamander (RFS). Construction will occur in two phases. The Phase 1 road will have both a rural undivided typical section with two 12-foot travel lanes, 5-foot outside paved shoulders, and drainage swales, and an urban undivided typical section with two 12-foot travel lanes, 4-foot paved bike lanes, a 12-foot multi-use path, and a curb-and-gutter stormwater collection system. Sufficient right-of-way (up to 264 feet) will be acquired to allow for future road capacity improvements (Phase 2 build-out). A new bridge approximately 5,570 feet in length will be constructed with 180 linear feet across the Blackwater River; build-out will include a second span. The bridge will begin south of the Blackwater River and continue on the north side of the river where it will terminate after crossing RFS critical habitat, the Blackwater Heritage State Trail, and the floodplain of Clear Creek. The Phase 1 bridge typical section will consist of two 12-foot lanes, a 6-foot inside paved shoulder, a 10-foot outside paved shoulder, a 1.5 foot barrier, and a 12-foot multi-use trail.

Comments

Federally listed species addressed in the BO that may be impacted by this project include the Gulf sturgeon (*Acipenser oxyrinchus desotoi* – Federally Threatened) and the reticulated flatwoods salamander (*Ambystoma bishopi* – Federally Endangered). In addition, there are several non-listed species that the Service has been petitioned to list

that could be found in the project area. These include the Escambia map turtle (*Graptemys ernsti*), and two dragonflies: Calvert's emerald (*Somatochlora calverti*) and the yellow-sided clubtail (*Stylurus potulentus*). Two state listed species also occur within the project area and could be affected by the project. These are the blackmouth shiner (*Notropis melanostomus* – State Threatened) and the alligator snapping turtle (*Macrochelys temminckii* – State Species of Special Concern).

The proposed alignment for the SR 87 connector road will cross the Blackwater River upstream of areas that are known to contain the blackmouth shiner. It is likely that this area contains habitat that is suitable for the blackmouth shiner to occur in the vicinity. The blackmouth shiner is highly vulnerable due to its short life span, the ephemeral nature of its habitat, and changes in water quality. FWC conducted a biological status review in 2011, as part of the revisions to the State's Imperiled Species listing process. The Biological Status Review for the blackmouth shiner can be obtained from the following FWC website: http://myfwc.com/media/2273265/Blackmouth-Shiner-BSR.pdf. An FWC background document entitled "Status of the Blackmouth Shiner" is attached for your reference.

The alligator snapping turtle has been reported from the Blackwater River, and may be presumed to be present in the vicinity of the proposed project. FWC conducted a biological status review in 2011, as part of the revisions to the State's Imperiled Species listing process. The Biological Status Review for the alligator snapping turtle can be obtained from the following FWC website: http://myfwc.com/media/2273250/Alligator-Snapping-Turtle-BSR.pdf. An FWC background document entitled "Status of the Alligator Snapping Turtle" is attached for your reference.

FWC staff familiar with the above taxa has reviewed the BO and the measures identified within the BO to avoid and minimize the potential impacts of the proposed project to the federally listed, federally petitioned, and state listed taxa.

FWC staff concurs with the Service's conclusions and biological opinion that the new SR 87 connector road project as proposed is not likely to jeopardize the continued existence of the Gulf sturgeon and reticulated flatwoods salamander and will not destroy or adversely modify their designated critical habitats. With respect to the Gulf sturgeon, we recommend expanding the pile-driving work exclusion dates (Conservation Measure #13, page 11) to also avoid the sturgeon out-migration period (October and November). The conservation measures that FDOT has agreed to, as part of general conditions and specifically for the Gulf sturgeon, and the Terms and Conditions/Conservation Recommendations of the USFWS biological opinion should be adequate to prevent take of the state listed blackmouth shiner. Further, the avoidance and minimization measures identified within the BO should have minimal impact to the state listed alligator snapping turtle.

We recommend that the final BO include a discussion of the federally petitioned Escambia map turtle, Calvert's emerald, and yellow-sided clubtail and identify that state listed species may be present.

If you need further assistance, please do not hesitate to contact Jane Chabre either by phone at (850) 410-5367, or at FWCConservationPlanningServices@MyFWC.com. If

you have specific technical questions regarding the content of this letter, please contact David Cook at 850-921-1021 or by email at david.cook@myfwc.com.

Sincerely,

Bradley J. Gruver

Bradley J. Gruver, Ph.D.
Section Leader
Species Conservation Planning Section
Division of Habitat and Species Conservation

SR 87 New Connector Road response to BO_18398_12132013.docx

Attachments
CC: FDOT, District 3, Chipley, FL (Peggy Kelley)
peggy.kelley@dot.state.fl.us

Status of the Blackmouth Shiner (FWC background document)

Biological Background

Reeve Bailey first collected this small minnow in 1939 in Pond Creek, a tributary of the Blackwater River. Bortone (1989) first described and named the species, with additional information provided by Suttkus and Bailey (1990) and Bortone (1993). The blackmouth shiner (*Notropis melanostomus*) is one of the smallest minnows (up to 38 mm standard length, or nearly 1.5 inches) and is recognized by its sharply upturned mouth. It has large eyes that have a diameter greater than the length of the snout. A dark midline stripe extends forward from the base of the tail to the snout. A lighter side band may border the upper edge of the dark midline band (Bass and Hoehn 2010).

The blackmouth shiner has been collected in isolated locales of the Blackwater River (and its tributary, Pond Creek), the Yellow/Shoal River Basins in Florida; Bay Minnette Creek in Alabama; and the Lower Black Creek, Chickasawhay, and Pascagoula Rivers in Mississippi (Bass et al. 2004, Bortone 1989, Bortone 1993, O'Connell et al. 1998, O'Connell et al. 2005, Suttkus and Bailey 1990).

While the life history and specific habitat requirements of the blackmouth shiner remain poorly understood, Bortone (1989, 1993) presents the most complete information on life history and habitat requirements. In general, the species inhabits quiet backwater areas and oxbow lakes off the main channel having no measureable flow and low pH (Bortone 1993, Gilbert 1992, O'Connell et al. 1998, Suttkus and Bailey 1990). Bortone (1993) indicated that most occurrences were typically within 5.5 meters from shore and associated with pond cypress (*Taxodium ascendens*), Atlantic white cedar (*Chamaecyparis thyoides*), various pine species (*Pinus spp.*), and sweet gums (*Liquidambar styraciflua*). Aquatic vegetation in inhabited areas typically included bogmoss (*Mayaca sp.*), pondweed (*Potamogeton sp.*), and bladderwort (*Utricularia sp.*). Bortone (1993) also indicated that abundance was not well correlated with water depth or most water quality (WQ) parameters of his study. Most schools observed in Bortone's study (1993) contained between 50 and 4,800 individuals, and were found at depths between 0.1 m and 0.8 m. Spawning may occur in 2 pulses: May and June and again in late summer.

Conservation History

The blackmouth shiner was listed by the Florida Game and Fresh Water Fish Commission (predecessor to the FWC) as Threatened in 1979, and then reclassified to Endangered in 1986. Several management plans have been developed for the Blackwater, Yellow and Shoal Rivers Basins. These include the Blackwater River Watershed Stewardship Plan (Blair et al. 2010), the Gulf Coastal Plain Ecosystem Partnership's Aquatic Management Plan for the Watershed of the Western Panhandle of Florida and Southern Alabama (TNC 2006) and the Blackwater River State Forest Management Plan (Department of Agriculture and Consumer Services, Florida Forest Service 2005). These plans contain recommendations for habitat management and restoration activities within the basins. While these plans were not designed for specific conservation and management of the blackmouth shiner, they contain strategies and recommendations that support the conservation needs for the species. Some of these plans have

received some funding for implementation, but additional funding and cooperation with state and local governments is needed.

Five sub-watersheds are considered high priorities for maintaining populations that are currently present or have persisted in these sub-watersheds over time. The city of Milton is within the Blackwater River/Pond Creek priority sub-watershed and the city of Crestview is in one of the Shoal River priority sub-watersheds. The Blackwater River State Forest and State Park comprise nearly all of the priority Blackwater River sub-watersheds. Approximately 14.6% of the total acreage within these five priority sub-watersheds is currently under public or conservation ownership. While the major conservation lands are within the Blackwater River State Forest and State Park, important areas near the city of Milton are part of the Blackwater River Water Management Areas. The 381 acres of the Blackwater River Water Management Areas are adjacent to a primary population center for the blackmouth shiner. There is approximately 180 acres within a Florida Department of Environmental Protection conservation easement on the southside of Pond Creek.

Threats and Recommended Listing Status

In 2010, the Florida Fish and Wildlife Conservation Commission (FWC) directed staff to evaluate the status of all species listed as Threatened or Species of Special Concern that had not undergone a status review in the past decade. To address this charge, staff conducted a literature review and solicited information from the public on the status of the blackmouth shiner,. The FWC convened a biological review group (BRG) of experts on the blackmouth shiner to assess the biological status of the species using criteria specified in Rule 68A-27.001, F.A.C. This rule includes a requirement for BRGs to follow the Guidelines for Application of the International Union for Conservation of Nature (IUCN) Red List Criteria at Regional Levels (Version 3.0) and Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1). FWC staff developed an initial draft Biological Status Review report (BSR), which included the BRG's findings and a preliminary listing recommendation from staff. The draft was sent out for peer review, and the reviewers' input was incorporated into a final report.

The Imperiled Fishes Survey Investigations collected the blackmouth shiner at 21 sites in only 2 major Florida river drainages (Bass et al. 2004). These 21 sites represent sampling from 5-6 locations as defined for the listing evaluation by IUCN. Primary threats to this species include changes in water quality and quantity, river impoundments for water supply, channel dredging, habitat alteration, encroachment of urbanization, and point source and non-point source pollution.

Based on the literature review, information received from the public, the BRG findings, and peer-review input, FWC staff recommended the blackmouth shiner be retained on the list of State-designated Threatened Species.

The BRG found the blackmouth shiner met the following criteria for listing as Threatened: Criterion (B) Geographic Range. Extent and Area of occupancy less than 2,000 km 2 (772 mi2), severely fragmented or exist in $\leq$ 10 locations, and extreme fluctuations in number of mature individuals.

It is possible the bluenose shiner area of occupancy in FL has always been <2,000km2. As such, conservation actions should focus on overcoming the triggered subcriteria by reducing the fragmentation or existence in greater than 10 locations, or by reducing extreme fluctuation.

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Status of the Alligator Snapping Turtle (FWC background document)

Biological Background

The alligator snapping turtle (*Macrochelys temminckii*) is the largest freshwater turtle in the New World (Enge et al. 2013), with males reaching 75 kg (165 lbs) or more; females weigh less than half this, often weighing below 25 kg (55 lbs) (Ewert et al. 2006). The head is massive, with a hooked beak, and the brown carapace (upper shell) bears 3 longitudinal ridges that are especially pronounced in younger individuals. The plastron (lower shell) is relatively small and cross shaped. With their large heads and long tails, hatchlings resemble miniature versions of adults. All life stages have a unique worm-like appendage on the floor of the mouth; this is used as a lure to attract prey. The mouth lining is camouflaged or mottled, in contrast to the pink mouth lining of the common snapping turtle (*Chelydra serpentina*).

The species' range centers on the lower Mississippi River and extends westward to Texas, northward to Illinois, and eastward to Florida. In Florida, it occurs in Gulf coastal rivers throughout the Panhandle from the Escambia River eastward to the Suwannee River system. (Ewert et al. 2006, Krysko et al. 2011). There are records of alligator snapping turtles from Eureka and the Ocklawaha River in Marion County that may have been the result of introductions from the Ross Allen's Reptile Institute at Silver Springs (Krysko et al. 2011). There are 2 sightings reported from the Wacissa River (Pritchard 1989), but recent trapping efforts have failed to confirm the presence of alligator snapping turtles in this river (P. Moler, Florida Fish and Wildlife Conservation Commission [FWC], personal communication). There are genetic data that indicate alligator snapping turtle populations in the Suwannee River drainage are distinct from other populations (Roman et al. 1999). This is supported by morphological data (T. Thomas, FWC, personal communication).

In Florida, alligator snapping turtles are restricted to rivers, streams, and associated permanent freshwater habitats, including impoundments. Food items include fish, turtles, snakes, birds, mollusks, and other aquatic organisms, with some vegetation, including nuts and fruits (Elsey 2006). Females lay a single clutch of 17 to 52 eggs per year; nesting typically occurs from late April to mid-May along river berms, high banks, and artificial spoil mounds (Ewert and Jackson 1994). Young emerge from nests in August and September. Additional life history information is available in Ewert et al. (2006), Pritchard (2006), and Ernst and Lovich (2009).

Conservation History

Because of past threats and probable declines, principally from harvest for food, the FWC enacted a series of protective measures for alligator snapping turtles in the past 4 decades. Chronologically, the most significant were limiting possession to 1 animal in 1974 and listing the alligator snapping turtle as a Species of Special Concern in 1985. In 2009, FWC prohibited all take and possession of the species. Take of the common snapping turtle was prohibited at the same time because of its similarity of appearance to alligator snapping turtles. To facilitate compliance with the prohibition of take from the wild, pet owners who possessed alligator snapping turtles before 20 July 2009 were required to obtain a Class III Personal Pet Permit to keep those turtles; the permit limits possession to 1 alligator snapping turtle. More information

on permits can be found on the FWC's website for possession of turtles. (Note: Use of "take" in this paragraph is as defined in Rule 68A-1.004(79), Florida Administrative Code [F.A.C.]) Because most naturally occurring alligator snapping turtle populations in Florida inhabit river systems that drain from Alabama and Georgia, protective measures in those 2 states are significant to Florida populations. The State of Georgia lists the alligator snapping turtle as Threatened, with no take except by permit, under its Endangered Wildlife Act of 1973 (391-4-10-.08). Although it does not have an Endangered species law, the State of Alabama lists the alligator snapping turtle as a nongame species with no allowable take except by special permit (Alabama Department of Conservation and Natural Resources, Nongame Species Regulation 220-2-.92).

Although not directed solely toward the species, conservation of alligator snapping turtles in Florida has been enhanced greatly by decades of extensive effort to conserve lands within its range. As a result, state, local, and federal agencies, as well as private organizations, have acquired much of the land bordering rivers inhabited by the species (see Habitat Conservation and Management). There are also numerous regulations in Florida that protect this state's waters, although threats to water quality and quantity remain. State and local regulations addressing water quality of Alabama and Georgia streams and rivers likewise are important for protecting habitat of alligator snapping turtles downstream in Florida.

Threats and Recommended Listing Status

Principal threats to the alligator snapping turtle previously included deliberate human take (as defined in Rule 68A-1.004(79), F.A.C.; now unlawful), incidental take with fishing gear (trotlines, bush hooks), pollution, riverine habitat alteration (channel dredging, snag removal, siltation, impoundment), and nest predation.

In 2010, FWC directed staff to review the status of all state-listed species that had not undergone a status review in the past decade. To address this charge, staff conducted a literature review and solicited information from the public on the status of the species. The FWC convened a Biological Review Group (BRG) of experts on the alligator snapping turtle to assess the biological status of the species using criteria specified in Rule 68A-27.001, F.A.C. This rule includes a requirement for BRGs to follow Guidelines for Application of the International Union for the Conservation of Nature (IUCN) Red List Criteria at Regional Levels (Version 3.0) and Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1). Staff from FWC drafted a Biological Status Review Report (BSR), which included the BRG's findings and a listing recommendation from staff. The draft was sent out for peer review, and the reviewers' input was incorporated into a final report, which was approved by the Commissioners (FWC 2011).

The BRG found that the alligator snapping turtle met the following criterion for listing:

- Criterion B, Geographic Range: Area of occupancy less than 2,000 km2 (772 mi2); severely fragmented because of limited genetic exchange between populations in separate rivers; and continuing decline inferred or suspected in area, extent, or quality of habitat.

After the review was conducted, FWC staff further considered the concept of "severely fragmented" and concluded that it does not apply to the alligator snapping turtle because the isolation of populations by drainage is natural and some genetic exchange likely occurs. The Regional Assessment of the BSR also noted the possibility of population rescue by turtles outside of Florida should a catastrophic event eliminate any Florida populations of alligator snapping turtles; the listing guidelines allow for altering the initial listing finding to a less imperiled status in such situations.

Based on the literature review, information received from the public, the BRG findings, staff's evaluation of the findings, and peer reviewer input of the staff-modified findings, the FWC recommends that the species not be listed as Threatened and that it be removed from the Florida Endangered and Threatened Species List.

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